ROADS AND STREETS

MARCH 1947

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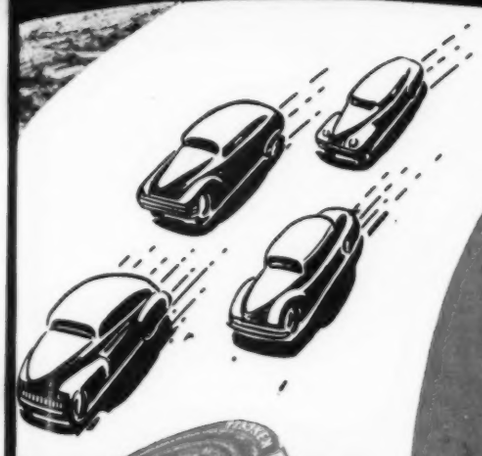
DETROIT

Oliver "Cletrac" Model F Tractor Equipped with Timken Bearings hauling Timken Bearing Equipped "Heil" cable-controlled scraper.



Modern construction machines equipped with Timken Tapered Roller Bearings set a fast pace in road building. They have the speed and stamina, the dependability and availability to get the job done on schedule — at minimum cost.

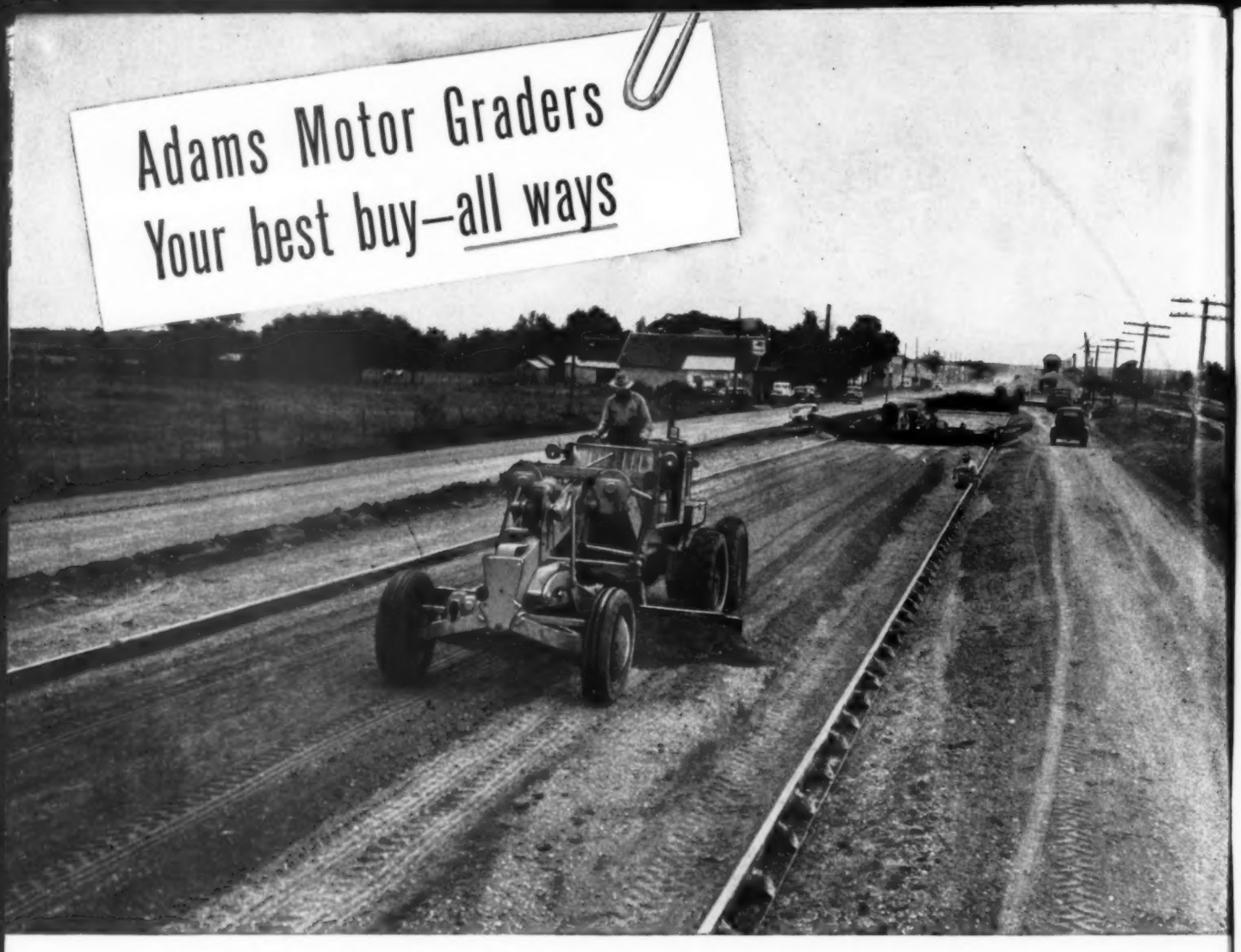
For Timken Bearings remove the drag of friction; the threats of wear, radial-thrust loads and misalignment; the high cost of lubrication and maintenance. They smooth the pathway of power wherever wheels and shafts turn.

Make "Timken Bearing Equipped" a must when buying any kind of construction machinery. Look for the trade-mark "TIMKEN" on every bearing you use.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◯ AND THRUST ◯ LOADS OR ANY COMBINATION



Positive Precision Control

ASSURES SMOOTH, ACCURATE CUTTING

ON ALL grading jobs where accuracy is an important factor, Adams' *Positive Precision Controls* help to meet the most exacting specifications—*in minimum time—with minimum effort and expense.*

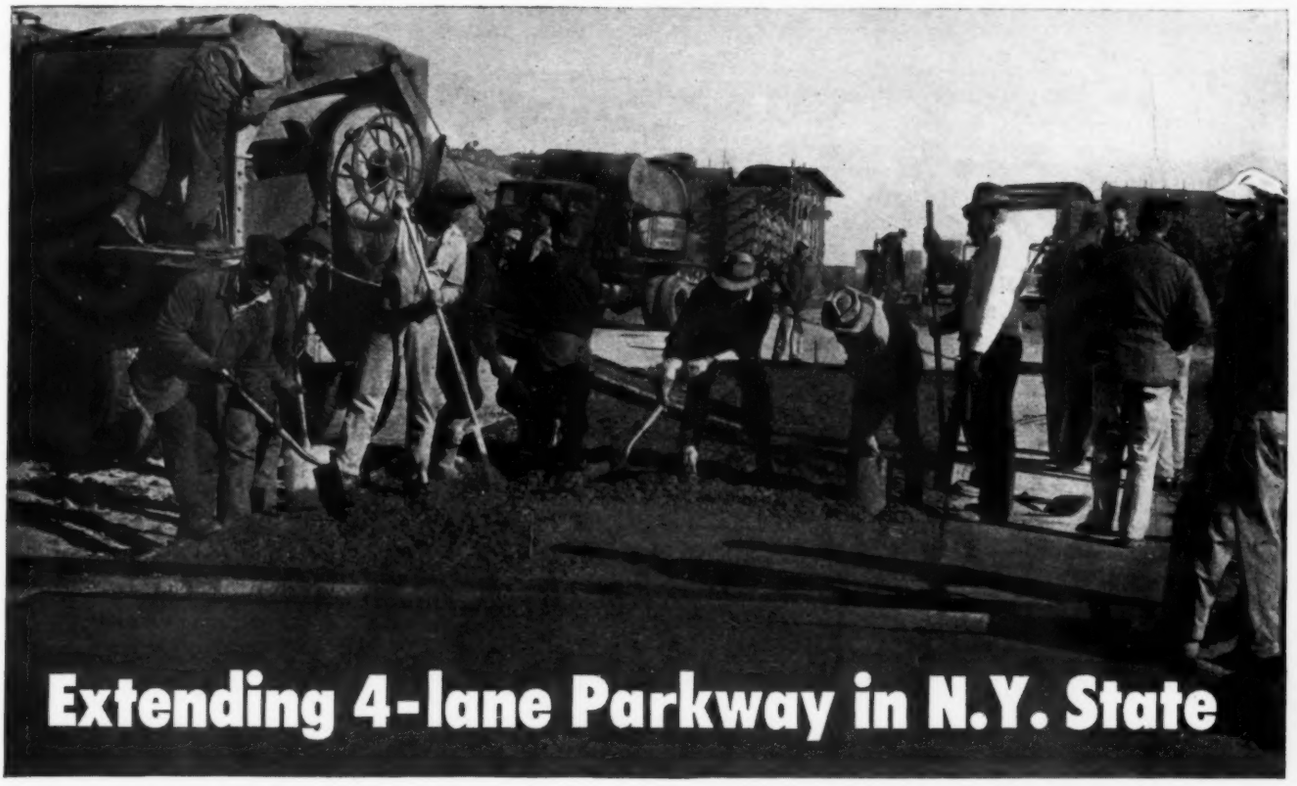
Some of the important features which contribute to the smooth, accurate cutting of Adams Motor Graders are: *Positive Fast-Acting Mechanical Controls*—for quick, accurate blade and scarifier adjustments . . . *Built-In Rigidity*—which holds blade and scarifier solidly in place . . . *Balanced Weight Distribution*—assuring always-ample pressures for forcing blade and scarifier into hard materials. And—Adams *8 Overlapping Forward Speeds* save time on all cuts by providing fastest practical speed on every type of grading operation.

Check Adams Motor Graders against any other graders on the market. You'll quickly discover why Adams Motor Graders are *Your Best Buy—All Ways!* See your local Adams dealer for complete details.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

Adams

Motor Graders
Elevating Graders
Leaning Wheel Graders



Extending 4-lane Parkway in N.Y. State

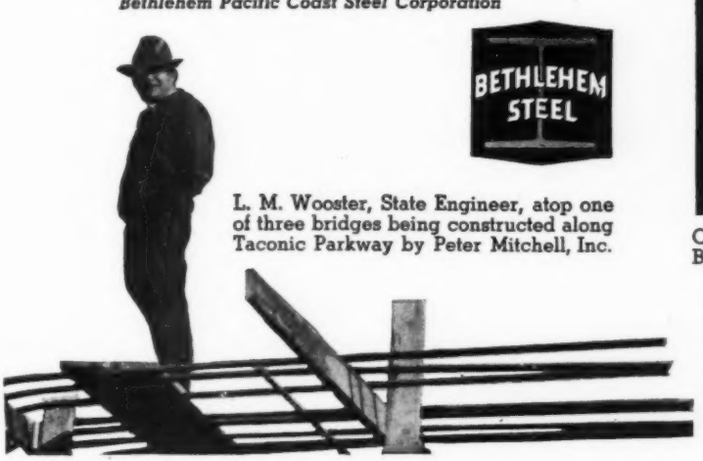
Paving gets under way at Freedom Plains, southernmost portion of new highway. Bridge approaches, of reinforced concrete construction, called for 10,800 sq yd of Bethlehem Bar Mats.

Long popular because of its scenic beauty and its complete lack of grade crossings, New York's express highway through the heart of Dutchess County—the Taconic State Parkway—is now being extended from Freedom Plains to Lafayetteville, a distance of approximately 27 miles.

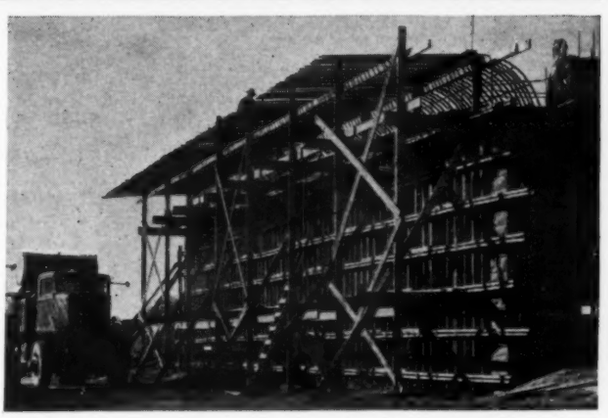
These photographs, taken near Freedom Plains, show construction activity on a 7.8-mile stretch of the new road being built by Peter Mitchell, Inc., of Greenwich, Conn. Reinforcing bars, bar mats, welded fabric and dowels were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

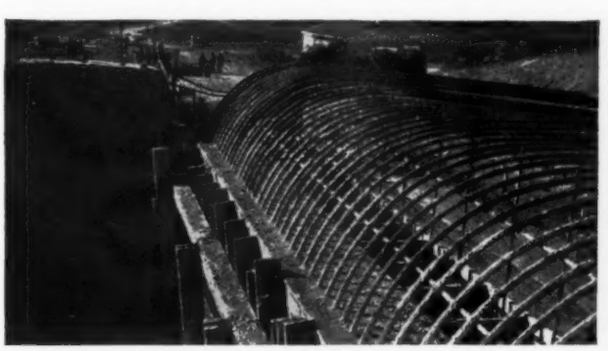
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation



L. M. Wooster, State Engineer, atop one of three bridges being constructed along Taconic Parkway by Peter Mitchell, Inc.



Of rigid-frame concrete-arch construction, stone-faced, and with a 48-ft span, bridge will carry heavy parkway traffic.



Close-up of Bethlehem Reinforcing Bars in bridge structure. Bridge required 72,500 lb of these sturdy bars.

STEEL FOR HIGHWAYS

Road Joints • Reinforcing Bars • Bar Mats • Guard Rail • Tie-Rods Guard Rail Posts and Brackets • Wire Rope and Strand • Spikes Hollow Drill Steel • Fabricated Structural Steel • Bolts and Nuts Sheet and H-Piling • Timber Bridge Hardware

MARCH, 1947 • VOL. 90 • No. 3

With Roads and Streets Have Been Combined
Good Roads Magazine And Engineering & Contracting

In This Issue

Coming Articles

Curing Slides with Drain Tunnels
How Oregon sinks test holes, plats the slide area, locates the slippage line, then tunnels in to tap the ground water

Concrete Resurfacing Busy Maryland US 40
Details of design and construction, 3.5 mile project, complete with panel of unusual job photos

North Carolina Modernizes US 1

Contractors at Work
Continuing this series of "camera trips" over road, street and airfield construction projects of special interest

Volumetric Proportioning and Continuous Mixing Asphalt Plant in Ohio
As described by an engineer familiar with this first use of such equipment in the state

How Milwaukee Dug Out of Record Blizzard
First-hand account of this city's recent 18-in. snowstorm and how municipal forces organized to clear gale-blown drifts; new equipment plans and lessons learned

Maintenance Notes from Michigan Counties
Concluding series of reports on winter and spring upkeep problems and methods

Job and Equipment Ideas
Kinks from contractor and road maintenance jobs as seen by the roving R and S editors

Equipment Maintenance Section
Plans and policies of leading road building organizations to step up efficiency of equipment care and repair

. . . and other articles on both the engineering and the practical field problems of our readers.

HAROLD J. McKEEVER, Editor
C. T. MURRAY, Managing Editor
H. K. GLIDDEN, Contributing Editor
V. J. BROWN, Consulting Editor

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A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

Gillette Publishing Company
Publication and Editorial Offices,
22 West Maple Street, Chicago 10, Ill.

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; H. J. CONWAY, Advertising Manager; Chicago Office: E. C. KELLY, E. H. HICKEY; New York Office: J. M. ANGELL, Manager, 155 E. 44th Street; Cleveland Office: LEE B. McMAHON, Manager, Leader Building; Los Angeles: DON HARWAY, West Coast Representative, 816 W. 5th Street.

Acceptance under the Act of June 5, 1934, authorized Jan. 25, 1938, at Chicago, Ill. Published monthly. Subscription price $3.00 per year in the United States and Canada and Latin American countries. All other countries $4.00 per year.

A king size 3/4 Yd. Machine

Power, strength, mobility, lifting capacity, adaptability —you get more of each in the ¾ yd. Lorain-41 than in other units of like capacity.

Check the features listed here—score them point for point against the field in the ¾ yd. class. You'll get the same answer as have hundreds of other shovel and crane users—the Lorain-41 has more "capacity for profits" than any machine of its class. See your local Thew-Lorain distributor for complete information now!

THE THEW SHOVEL COMPANY
LORAIN, OHIO

TURNTABLE FEATURES

Simplified Center Drive direct-to-the-point power application on turntable.

Sloping machinery frame places machinery far back of tipping point where it counter-balances loads for maximum lifting ability.

Roller bearing mounted Swing Drums, actuated by long life shoe clutches.

Steel Erector's Precision Boom Hoist, with "Micrometer" power control of boom lowering (on cranes).

Easily assembled pin-connected crane booms, with center sections and extension tips.

Independent, positive chain crowd shovel boom.

"Cable-Miser" dragline fairlead prolongs cable life.

CRAWLER FEATURES

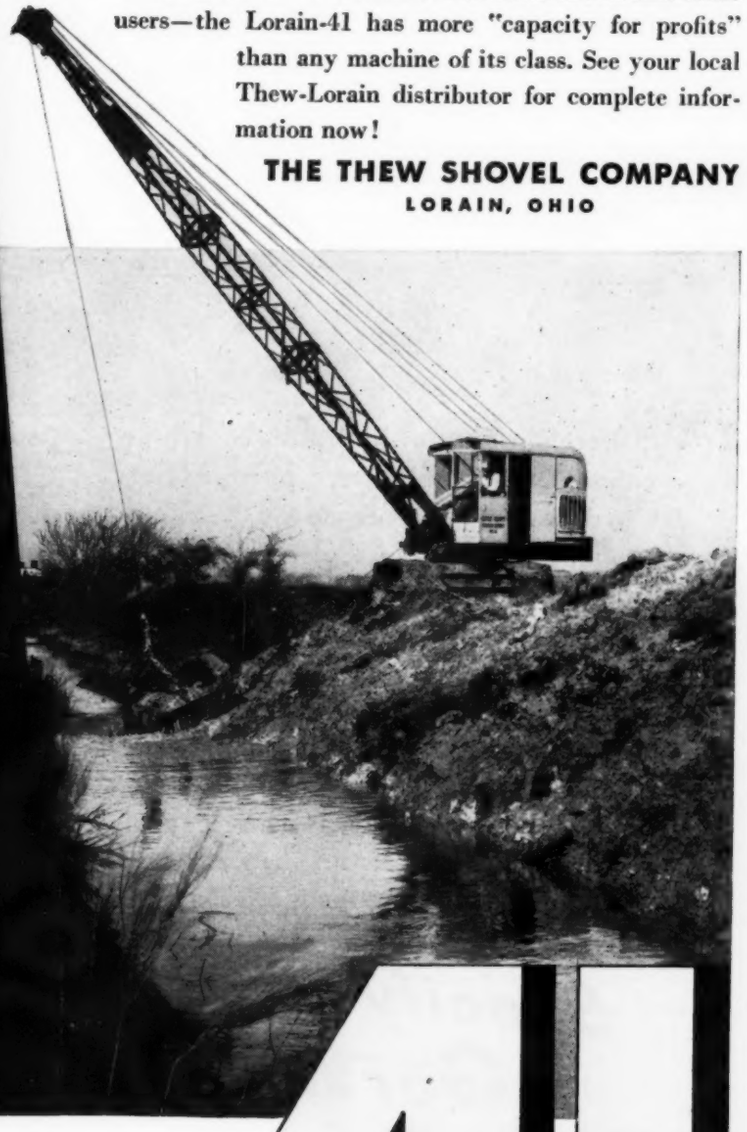
Heavy-duty chain drive.

2 travel speeds—in both directions—provided as standard equipment, no extras.

Crawler steers from operator's position with turntable in any position of swing.

A positive 4-way tread and travel lock.

Drop forged treads, 30" wide, swamp type, self-cleaning.



Thew Lorain 41

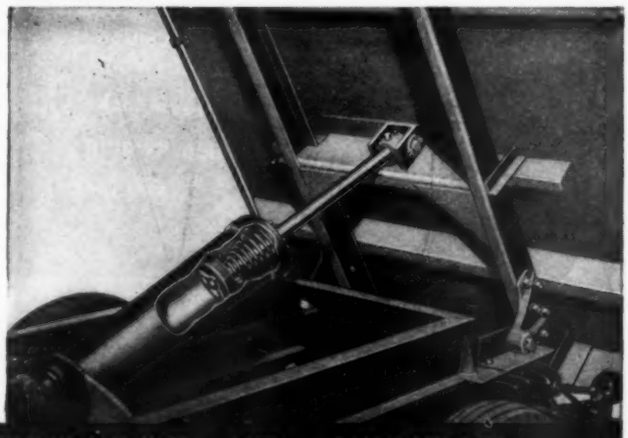
There's *plenty* of hydraulic muscle in those Gar Wood Hoists . . . plenty of *guts* to do a clean, quick dump job, no matter what you're hauling . . . plenty of *dependable* power to help you get your job done easier.

Why? They're *rugged*. All Gar Wood Hoists and Dump Bodies are designed, engineered, and built to do the toughest kinds of jobs.

What do *you* work with . . . sand, gravel, rock, coal, construction material? Whatever you carry, there's *at least* one type of Gar Wood Hoist and Dump Body to make the job easier, faster, safer . . . help you make more money-per-job.

Want proof? Ask the men who use Gar Wood Hoists and Dump Bodies on the toughest jobs all over the world . . . year in and year out. Ask them for an honest appraisal. See if they don't agree that *if it's Gar Wood it's got to be good!*

Then, for your *own* good . . . specify Gar Wood!



Specify **GarWood**

GAR WOOD GW INDUSTRIES

HOIST & BODY DIVISION
WAYNE, MICHIGAN

HOISTS • BODIES • WINCHES • CRANES • BOATS • HEATING EQUIPMENT • TANKS • ROAD MACHINERY

Here's what your money buys in a NORTHWEST

INDEPENDENT CROWD plus AUTOMATIC CROWD
FOR GREATER DIGGING POWER
The DUAL CROWD

- **Simplicity of design**
  —for easy upkeep in remote areas.
- **The Northwest Dual Independent Crowd**
  —utilizes force other shovels waste.
- **Cast Steel Bases with Cast Steel Machinery Side Frames**
  —plenty of strength—keep shafts in alignment.
- **"Feather-Touch" Clutch Control**
  —easy operation without fear of shut down because of control failure.
- **Cushion Clutch**
  —reduces overloads on parts under power in heavy digging.
- **Helical Gear Drive**
  —there is no finer power take-off.
- **Uniform Pressure Swing Clutches**
  —trouble-free—fewer adjustments—smooth operation.
- **Ball or Roller Bearings on all high speed shafts**
  —minimum loss of power to friction.
- **Positive Traction while turning as well as when going straight ahead**
  —Northwests go where other machines have difficulty.
- **Crawler Gears fully enclosed**
  —full protection against rough going.
- **Easy convertibility to Crane or Dragline**
  —makes possible quick conversion for stripping or handling materials or machinery around the plant.

Here is a combination of features you won't find on any other make of machine—it's a real Rock Shovel—a Mine and Quarry Shovel that has proved itself in rock and hard digging everywhere. There is a size for every problem. Let us send you details on the size machine that interests you.

it's a Rock Shovel won't have orry about ut in dirt

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NORTHWEST

Convertible for any Mining, Material Handling or Excavation Problem

NEW small TOURNAPULL fo

23 m.p.h. top speed

3.3 yards pay dirt

Self loading

Positive power steer

Electric control

85 h.p. gasoline engine

Tires { 14:00 x 32 primemover
9:00 x 16 on Carryall

Weighs 7½ tons empty

Tournapull, Carryall — Trade Mark Reg. U. S. Pat. Off.

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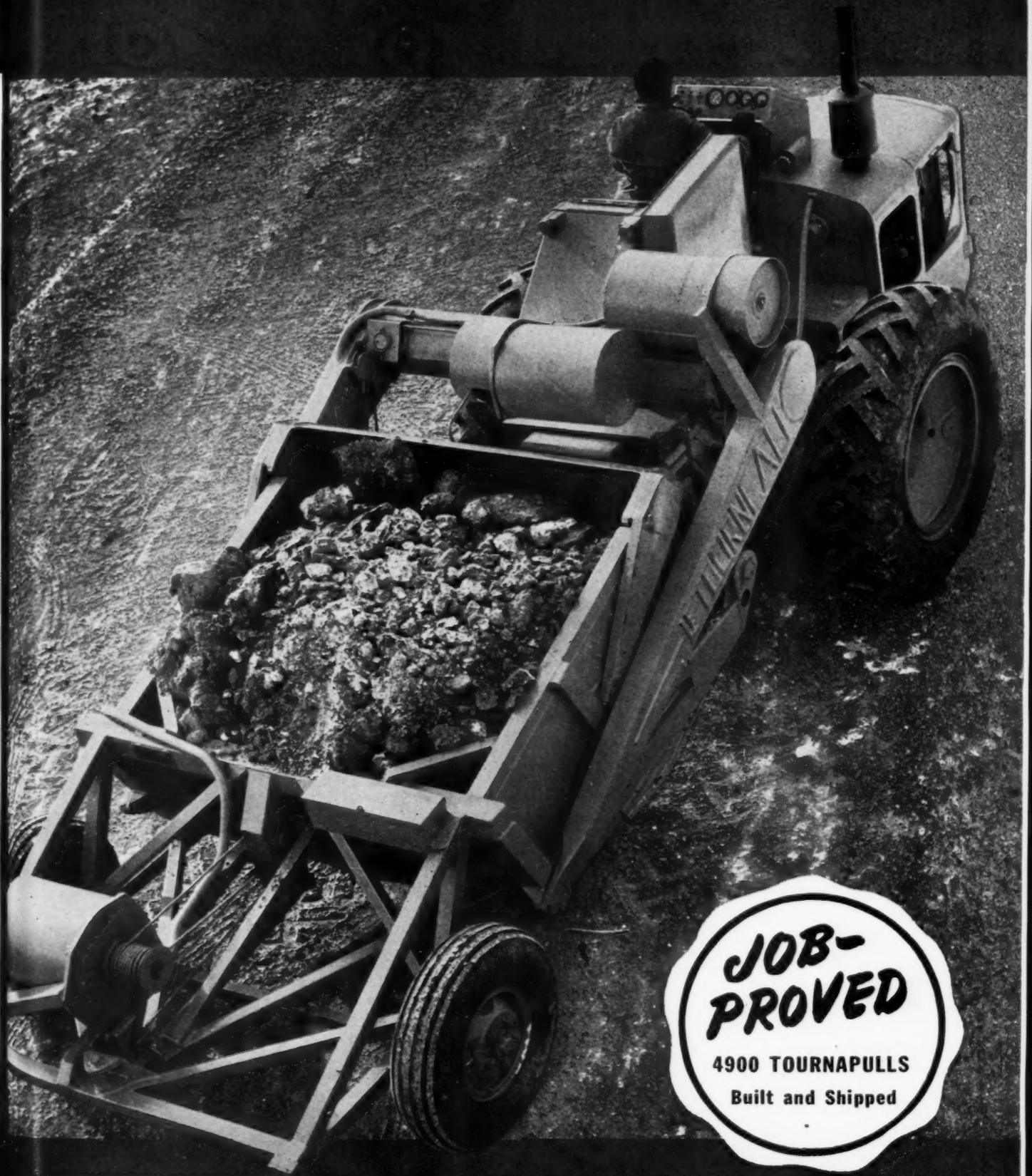
EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

L for high-speed dirtmoving



JOB-PROVED

4900 TOURNAPULLS Built and Shipped

LETOURNEAU PEORIA, ILLINOIS TOURNAPULLS

"99-H" THE POWER GRADER

ALL-WHEEL DRIVE

provides tremendous earth-moving ability under all ground conditions. The entire weight of the machine is on the driving wheels—front and rear—contributing 100% to traction.

ALL-WHEEL STEER

speeds up and simplifies every job; makes it easy for the "99-H" to go places and do things that are impossible for ordinary motor graders.

PLUS

HIGH LIFT BLADE

The "99-H" does a superlative job of bank sloping. All-Wheel Drive provides maximum traction for work in soft or wet ground. All-Wheel Steer enables the operator to make straight-line bank cuts, even under constantly varying conditions.

Working right-handed (or left-handed), the operator can position the blade for all ditching, maintaining or grading work; then quickly and easily high-lift it to any desired bank cutting position—including the vertical—without leaving the platform.

ER THAT HAS EVERYTHING!

CONTROLLED TRACTION

places the rear end of the machine where it will most effectively resist the side thrust of the load on the blade; enables the blade to move more material, farther and faster.

PRECISION SIDE SHIFT

makes it possible to sideshift a loaded blade while the machine is moving, with no change in working angle, and no tendency for one end of the blade to leave the road and the other end to gouge into it.

EXTREME BLADE REACH

With the machine running straight, the blade can be extended 90 inches beyond the outside line of tires. Using Rear Steer makes it possible to reach 10 feet, 3 inches beyond the rear tire—a figure not even approached by any other grader.

COMPLETELY REVERSIBLE BLADE

All-Wheel Steer greatly simplifies the operation of grading in reverse—should it ever be necessary with the highly maneuverable "99-H"—by providing perfect steering control of both ends of the machine.

No Motor Grader without All-Wheel Drive and All-Wheel Steer can hope to equal the all-around operating efficiency of an Austin-Western "99" Power Grader. This was true of the "99" and "99-M." It is even more true of the "99-H" with its exclusive All-Wheel Drive, All-Wheel Steer, Controlled Traction and Precision Sideshift, PLUS High-Lift Blade, Extreme Blade Reach and Completely Reversible Blade.

With its 76-horsepower engine and 13-foot blade, the "99-H" moves maximum quantities of material; works in soft or wet ground where other motor graders cannot work; climbs banks and crosses gulleys; works on narrow, winding roads, and, in general, completely outperforms ordinary motor graders.

The widest variety of attachments is available—Scarifier, Snow Plow, Snow Wing, Bulldozer, Roller, Loader—each just that much more effective than it would be on an ordinary motor grader, by reason of All-Wheel Drive and All-Wheel Steer.

Your nearby Austin-Western distributor will be glad to tell you the whole story of *"The Power Grader That Has Everything."*

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

3 CU. FT. OF ANY COLD MIX ASPHALT IN 30 SECONDS

5 seconds + **charging**

20 seconds + **mixing**

5 seconds **discharging**

The FOOTE *Kinetic* mixer

AN entirely new mixing principle brings small asphalt jobs into the profit picture for contractors with the Foote Kinetic Mixer.

Asphalt driveways, sidewalks, tennis courts, floors and parking areas can now be laid with material mixed on the spot . . . For the first time, you can take the asphalt plant to a *small job . . . profitably.*

Here's how Foote Kinetic Mixing principle works: Centrifugal force, created by revolving drum is converted to high-speed mixing action by an energy converter blade and cross-mixing blenders. Asphalt is shot into material immediately beyond energy converter —and the complete, thorough job is done, even on stiff mixes, *14 seconds after asphalt flow stops!*

Get Foote Kinetic Mixer details from your nearby Foote Representative—or write us for Bulletin No. K-100.

See Page 55.

The FIRST *and Only* Small ASPHALT PLANT

THE FOOTE COMPANY, INC., 1936 State Street, Nunda, New York

BUILDERS OF FOOTE-KINETIC MIXERS, MULTIFOOTE CONCRETE PAVERS, AND ADNUN BLACK TOP PAVERS

ONE MAN Roadbuilder

ALLIS-CHALMERS 2-CYCLE DIESEL TRACTOR WITH BULLDOZER AND SCRAPER

GREATER SUSTAINED PULLING POWER

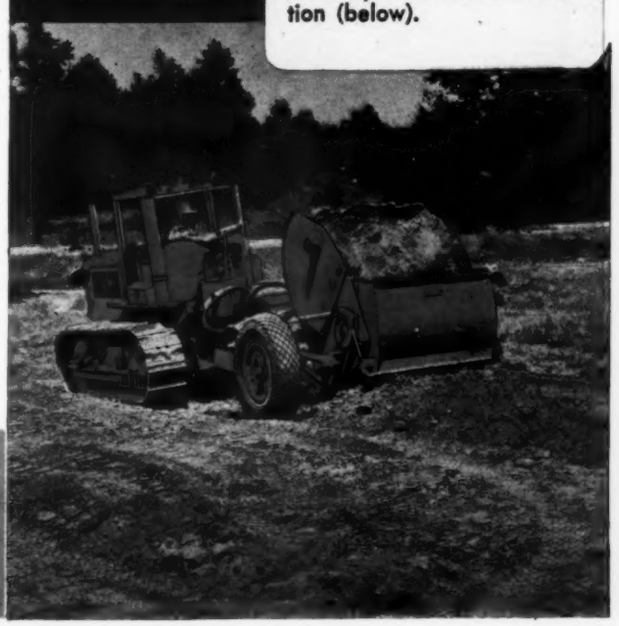
of Allis-Chalmers Diesel Tractors and exceptional digging ability of Gar Wood 2-wheel scrapers enables you to load toughest materials quickly—including gumbo, hardpan and shale. The new HD-5 (above) is the ideal tractor for efficient work with the 3-yard scraper. For larger capacity . . . HD-7 tractor and 5-yard scraper is the correctly matched combination (below).

Nearly all the dirt-moving jobs involved in the construction of a road can be handled with this fast-stepping combination. It's practically a one-man roadbuilder. You can use it three ways . . . with both scraper and bulldozer at the same time or with either unit alone.

There's the bulldozer for leveling, tearing down banks and other 'dozer work. There's the 2-wheel scraper for regular cut to fill dirt-moving. . . plus handling a multitude of other jobs. Rear-dump feature widens its usefulness. You can place material exactly where you want it — over slopes, around bridges, culverts and other close places. It is especially handy for digging trenches for pipe and culverts, making driveways and approaches and cleaning ditches.

An ideal, all-'round outfit for townships, cities, counties . . . it's a mighty useful combination for all contractors, as a principal dirt-mover or as an auxiliary unit. Takes over much of the work of bigger, more expensive equipment and relieves hand labor. It will pay you to investigate this one-man roadbuilder. Get all the facts from your Allis-Chalmers dealer.

Rugged! Tough! Dependable!



ALLIS-CHALMERS

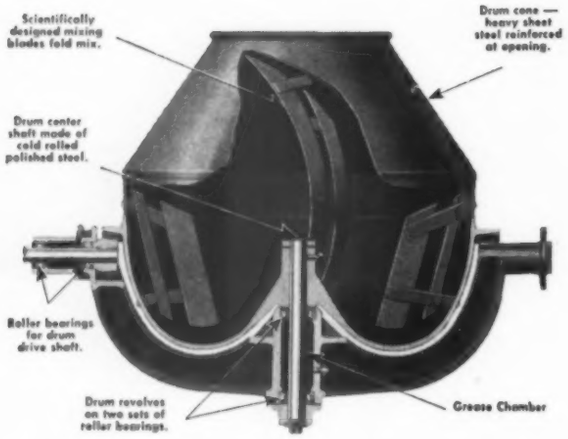
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

NEW KWIK-MIX 3½-S DANDIE

END DISCHARGE

Gets Loaded Barrow Off to Form Fast and Easy with ½ the Effort

Backing and turning loaded wheelbarrow away from mixer is tough on back and arm muscles, slows down the crew sooner or later. End discharge feature of the new Kwik-Mix 3½-S Dandie concrete mixer eliminates need for backing and turning loaded wheelbarrow. Because end discharge permits free approach from all angles, you turn before you approach mixer, then spot barrow sideways to mixer, facing toward form. When wheelbarrow is loaded, you pick up and go. No backing, no turning. You save time and ½ the usual effort, eliminate end-of-shift fatigue, get more concrete hauled every shift.


Scientifically designed mixing blades fold mix.
Drum cone — heavy sheet steel reinforced at opening.
Drum center shaft made of cold rolled polished steel.
Roller bearings for drum drive shaft.
Drum revolves on two sets of roller bearings.
Grease Chamber

Inside the Dandie drum, two long and two short mixing blades fold cement and aggregates. Husky drum bowl is securely cradled in high strength yoke. Roller bearings assure smooth running.

KWIK-MIX COMPANY

KOEHRING SUBSIDIARY • PORT WASHINGTON, WISCONSIN

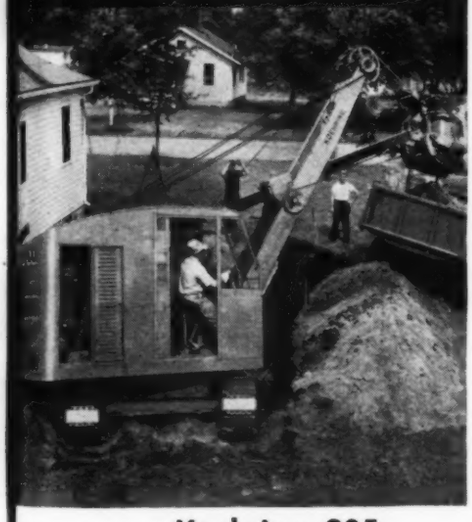
711

EASIER SPOTTING No Tip-overs with New *PUSH-DOWN* Tow Pole

To move the new Kwik-Mix Dandie End Tilter, tow pole is pushed down, not up. You use your weight, not your muscle. Every time you move the 3½-S Dandie or hitch it to the truck, you benefit from this exclusive feature.

Because you push tow pole down, not up, this mixer just can't tip over. When you release tow pole, mixer always lands on legs. When you push too far, tow pole hits ground before mixer can go off balance.

Heavy-Duty Means More Basements

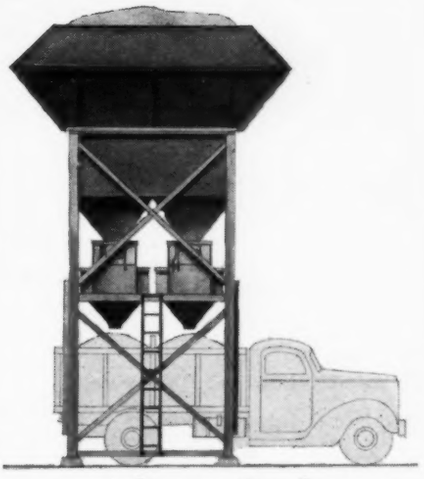


Koehring 205 Half-Yard Shovel

These features produce more basement every shift: All main shafts run on anti-frictions . . . trigger fast dipper trip works positively, every time, in just ½ second. Square corners, walls straight, tight to stake lines easy, because clutches and brakes respond instantly, smoothly.

KOEHRING COMPANY
MILWAUKEE 10 WISCONSIN

1-Stop Loading for 2-Batch Trucks

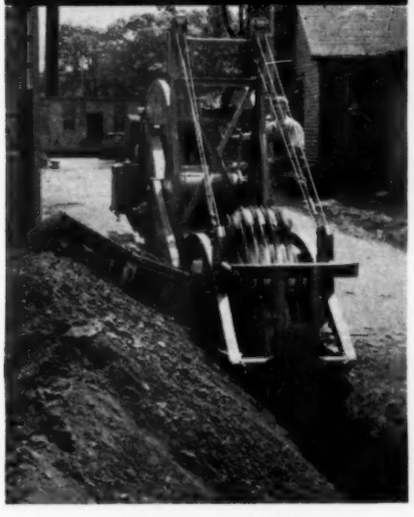


Johnson Dual Aggregate Batch Plant

With the Johnson Dual Aggregate Batching Plant, you spot batch trucks just once for a two-batch load. Both batches are discharged simultaneously. Extra spot stops are eliminated. On most jobs, number of hauling units can be materially reduced.

C. S. JOHNSON COMPANY
CHAMPAIGN ILLINOIS

Husky Wheel is Pivot-Mounted



Parsons 200 Wheel Trenchliner

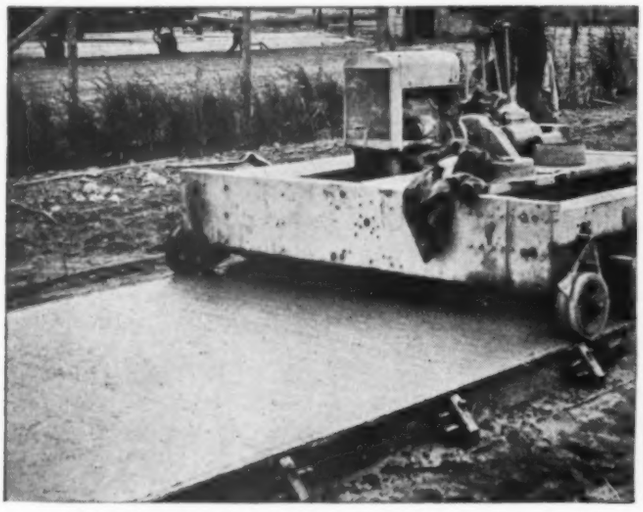
Latest addition to the Parsons line. Built for mile-a-day pipeline work, farm and railroad drainage. Pivot-mounting of wheel simplifies fine grading of trench bottom. Improved wheel support. Two dollies at wheel bottom. Gears fully enclosed in oil tight case.

PARSONS COMPANY
NEWTON IOWA

Simple as

No added materials. No unusual changes in procedure. Making concrete that is highly scale-resistant and otherwise better at no extra cost is simply a matter of using Atlas Duraplastic air-entraining cement. For example, on Route 25, New Jersey:

REDUCED SEGREGATION: Duraplastic concrete is more cohesive ... flattens out without segregation ... coarse aggregate is well covered with mortar.



IMPROVED PLASTICITY of Duraplastic concrete is illustrated by appearance and over-all texture of surface after first screeding.

MINIMIZED BLEEDING is characteristic of Duraplastic concrete. Finishers may follow closely behind paver. This reduces long waits and overtime at end of day's run and permits early protection for curing.

It's as simple as A, B, C. Duraplastic cement makes better concrete at no extra cost. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Cleveland, Dayton, Des Moines, Duluth, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

RS-D-48

AIR BUBBLES IN CONCRETE MAKE IT MORE DURABLE AND MORE PLASTIC

ATLAS DURAPLASTIC TRADE MARK REG. U. A. C. CO.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel—Sunday Evenings—ABC Network*

GET A LOAD OF THIS LOW-COST MIXING!

Speeding to your construction work, the new Ransome Blue Brute Horizontal Truck Mixer has a way of turning out the best in concrete at costs that mean money in the bank for you. Features like these are the secret of its always expert performance:

Exclusive drum design, stronger and lighter, with Ransome's famous mixing action . . . chilled car wheel metal rollers, each on two Timken roller bearings and running on extra-heavy, heat-treated track . . . smooth, positive gear-and-pinion drive . . . improved transmission with single lever control, two speeds forward and reverse, separate engine clutch and multiple disc reversing clutches . . . trouble-free water system with enclosed pump-clutch, leak-proof poppet valves and unbreakable anti-freeze gauge glasses.

Built with capacities of 2, 3, 4½ cu. yds., this new Ransome Truck Mixer is easier to start, to control, to maintain —a sure bet for time-saving, economical concrete production in transit.

Up above, of course, that's another Blue Brute leader — a Ransome "Big" Mixer — top performer at so many central mixing plants and big-time construction jobs . . . and another reason why *there's more worth in Worthington-Ransome.* R7-4

KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis.

RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

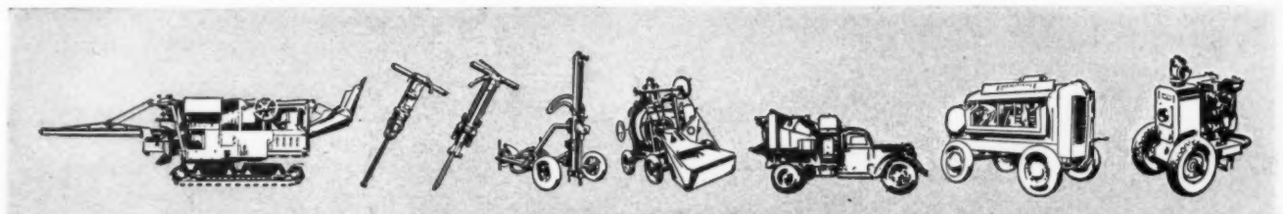
WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

WORTHINGTON

Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

BUY BLUE BRUTES



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

TRUSCON
WELDED STEEL FABRIC

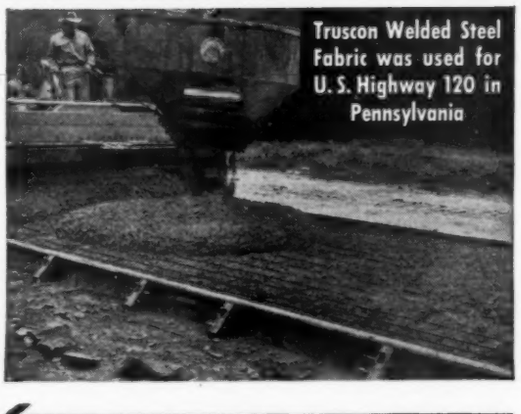
Helps Keep The Job Moving Steadily ... Helps Keep Traffic Rolling Longer

Helping the crew stay well ahead of the mixer . . . and helping the tax-payer's highway dollar stay well ahead in value . . . that's the job that Truscon Welded Steel Fabric is doing in America's finest concrete highways.

Engineers and designers have found by experience, practice and research that the following advantages can be expected from Truscon Welded Steel Fabric:

- **Provides resistance to cracking due to shrinkage of concrete during setting period.**
- **Provides tensile strength necessary to resist subgrade friction caused by expansion and contraction of the concrete slab.**
- **Provides increased resistance to cracking of concrete due to warping.**
- **Provides resistance to the development of microscopic cracks into visible cracks.**
- **Provides resistance to cracks opening and allowing entrance of water.**
- **Provides resistance to broken ends of slabs separating at a crack.**
- **Decreases spalling and progressive disintegration of the concrete.**

When you plan roads, plan them well. Use structural designs that have been proved the most economical, durable and serviceable in the long run. Use Truscon Welded Steel Fabric with other associated Truscon roadbuilding products, and assure lasting prestige for you and more permanent highways for the communities you serve.



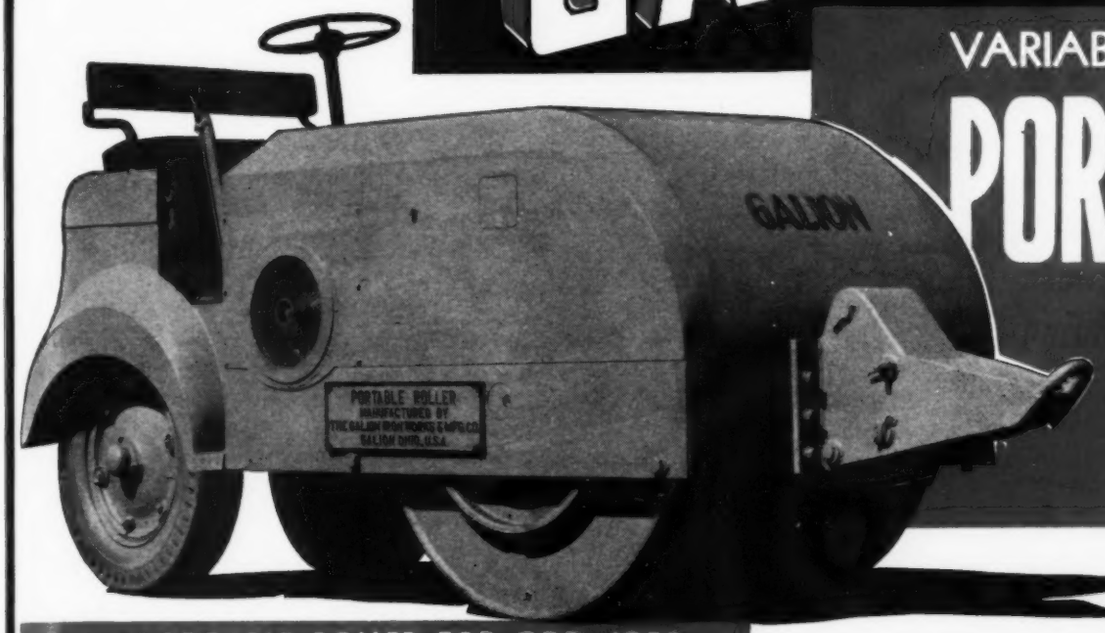
Truscon Welded Steel Fabric was used for U. S. Highway 120 in Pennsylvania

TRUSCON STEEL COMPANY
Reg. U. S. Pat. Off.
YOUNGSTOWN 1, OHIO • Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Welded Steel Fabric . . . Concrete Bars . . . Contraction Joints . . . Dowel Assembly Units . . . Curb Bars . . . Complete Steel Buildings.

GALION

VARIABLE WEIGHT PORTABLE



Weight 6,700 pounds, water ballasted to 9,365 pounds.

A PROFITABLE ROLLER FOR ODD JOBS

TRANSPORTS LIKE A TRAILER

PATCHING, MAINTENANCE, or NEW WORK

COMPLETELY ACCESSIBLE

A new and improved Portable Roller that combines high compression efficiency, versatility and portability. Widely used and favored for its economy and effectiveness by contractors and highway, street, and airport maintenance departments.

Write for Catalog No. 295.

THE GALION IRON WORKS & MFG. CO.
General and Export Sales Office
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GALION IRON WORKS

hydraulic GRADERS · ROLLERS

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CECO at work
2 Ceco material data cuts down your detail work
3 One order brings you Ceco materials as needed

a 3 Point Program
for Surer Road Building Profits

CECO offers you more than precision road building materials. It offers you a 3-point program for surer profits based on construction knowledge gained from years of practical experience. Call any one of 23 offices located coast to coast, for engineering skill and fine road building materials . . . plus a plan for road building profits. Remember Ceco's 3-point program takes the guesswork out of bidding, cuts down your detail work and one order brings you materials where you need them, when you need them.

CECO STEEL PRODUCTS CORPORATION
GENERAL OFFICES: 5701 West 26th Street, Chicago 50, Illinois

CECO STEEL

TYPICAL CECO HIGHWAY PRODUCTS • Welded Wire Fabric • Metal Center Strips Cecure Curing Compound • Reinforcing Steel • Load Transfer Devices • Joint Sealing Compound Dowel Bar Supports and Sockets • Stake Pins • Expansion Joints • Sub-Grade Paper

In construction products **CECO ENGINEERING** *makes the big difference*

You Get FULL VISIBILITY

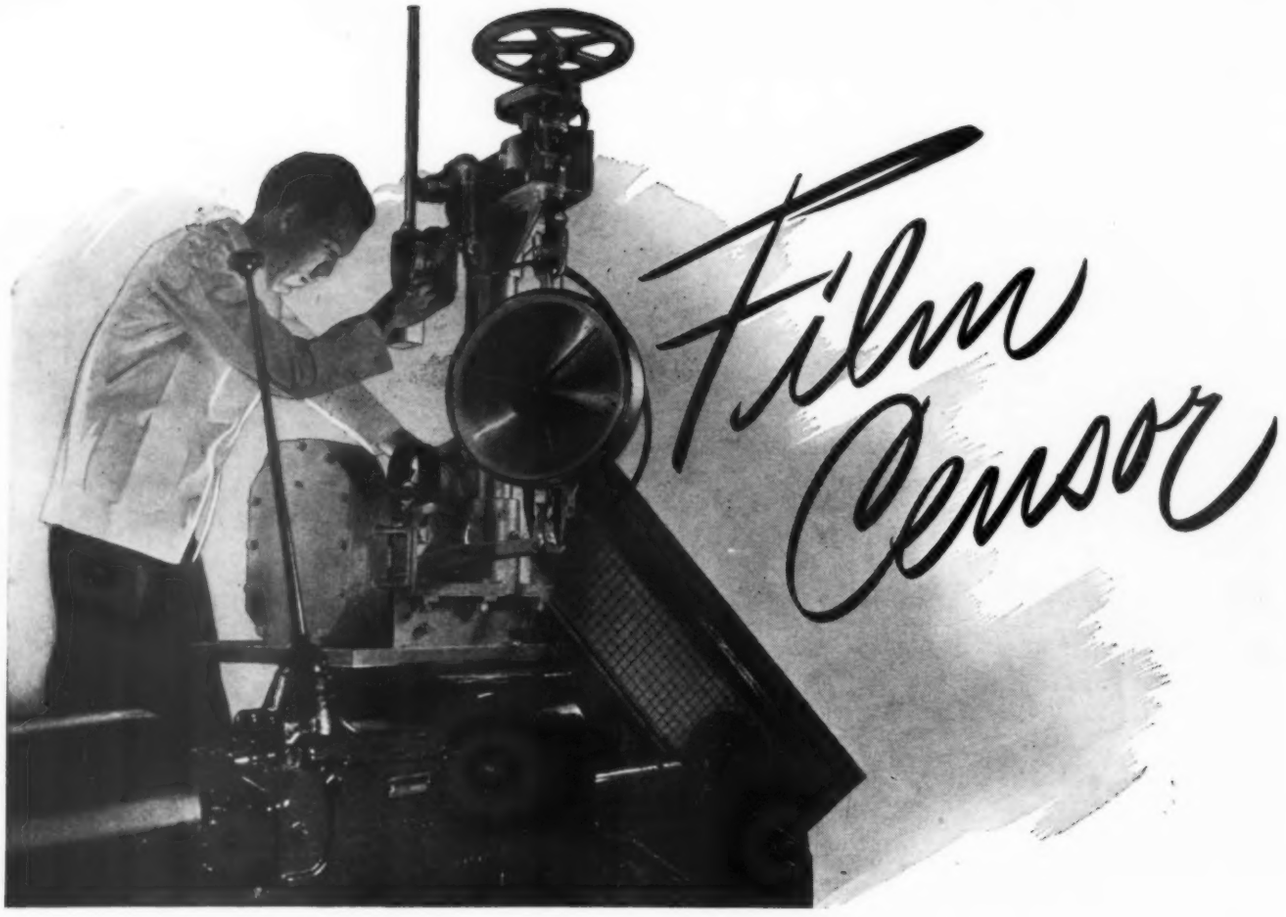
with the BUCYRUS ERIE DOZER-SHOVEL

Your operator can always see what he's doing on a DOZER-SHOVEL. In shovel operations he can see the bucket as it enters the digging, watch it get a full load. He can see the ground over which he must move to reach his dumping position. He can see to spot the bucket exactly where he wants it for accurate dumping. In 'dozing, the operator can see just what he's doing. There are no frames, winches, hydraulic cylinders or other obstructions to block the operator's full front vision on the DOZER-SHOVEL. That means faster, safer operating cycles day-in and day-out.

There are other features, too, which make the DOZER-SHOVEL unique. Combined with a Trac-TracTor it makes a balanced digging unit which retains all the inherent characteristics of the tractor. Ask your International TracTracTor distributor what that will mean to you. Ask him, too, about the DOZER-SHOVEL'S oscillating tracks, low clearance and other features offered by no other machine.

18T45

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN



The alert technician in the illustration is censoring film—the strength of film in Sinclair industrial lubricants designed for protection of your valuable machinery.

These tests prove that Sinclair lubricants have the film strength to keep moving metal parts separated under extreme temperature and pressure conditions. With the SAE film strength test machine, skilled laboratory technicians check constantly, reject sub-standard product, assure you of essential protection.

Every batch of lubricant in process gets an equally careful check for other all-important qualities. Constant research by Sinclair assures you of the benefits of new developments in film strength...and in all other prime lubricant qualities.

Sinclair Automotive Lubricants

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OPALINE MOTOR OIL
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(For severe service)
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OPALINE GEAR LUBRICANTS
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FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

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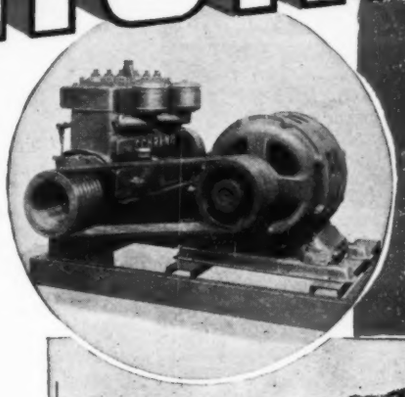
SINCE producing the first portable Compressor in 1908, SCHRAMM LEADERSHIP has been constantly maintained. Standards of construction continually revised, until today Schramm offers the most advanced line of air producing equipment that can be found anywhere. Modern manufacturing methods together with suitable high grade materials result in a unit that gives dependable trouble free services — always.

There is a rugged Schramm unit designed to take care of your Compressed Air needs. Contact branch nearest you or consult our engineering department for recommendations.



SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
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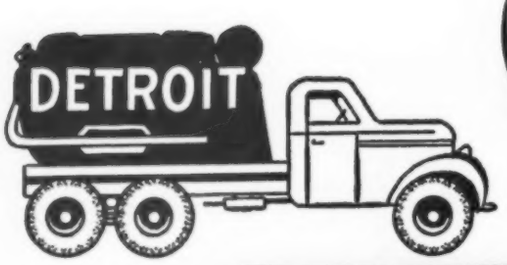
Air **WHERE, WHEN AND AS MUCH AS YOU NEED.**

AN *Important New* NAME TO REMEMBER



manufacturers of products you already **KNOW** *are* **BEST**

Converts Medium Trucks to Heavy Duty Six-Wheelers

Automatic Locking for Truck Axles

This is another way of telling you that

THORNTON TANDEM CO.

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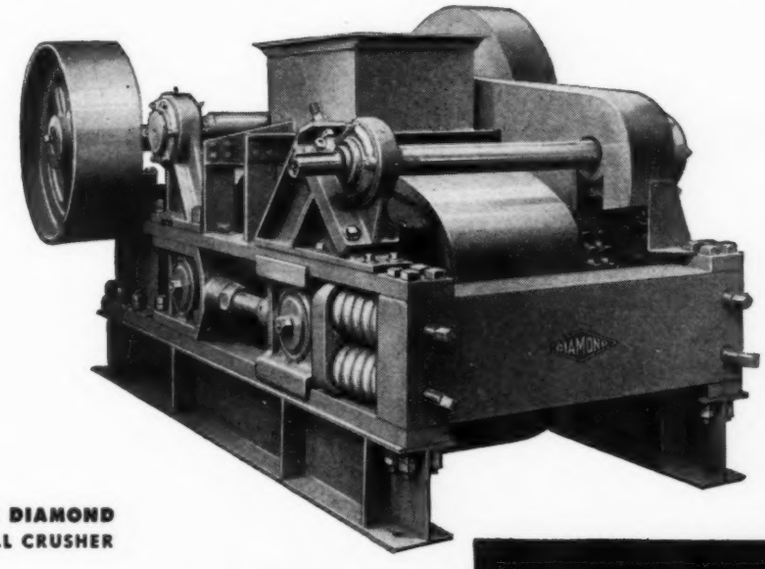
Distributors: *in U.S.A.,* **TRUCKSTELL DISTRIBUTORS;** *Export,* **HERTHORNWAY EXPORT CORP.**

A BRUTE WITH ABILITY...

TO TAKE LONG TIME PUNISHMENT



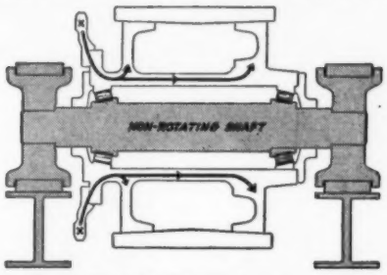
THE DIAMOND
ROLL CRUSHER

THERE'S NOTHING TOUGHER THAN A DIAMOND

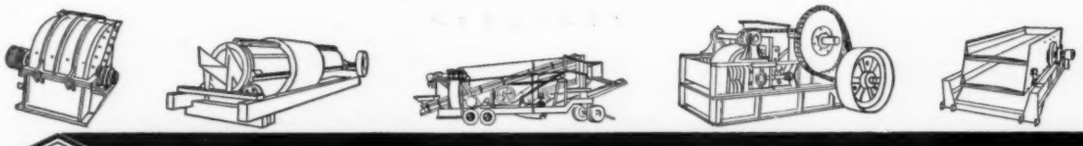
Any Owner of a DIAMOND Roll Crusher Will Tell You...

Diamond Roll Crushers, of whatever size, are designed throughout for ample margin over rated capacity. Years of watchful experience are engineered into every part—the experience of cooperating owners throughout the world—operators who have consistently improved their profits with Diamond-engineered equipment.

SEVERAL REASONS WHY...



The working rolls of the Diamond rotate on a stationary shaft. Internal housing allows larger roller bearings—more rollers to take the punishment. Rolls are driven through large cast steel sprockets bolted directly to the roll-head, totally relieving twisting stress on shaft. .the DIAMOND can take more punishment. *Your Diamond dealer has Bulletin D-45C—for full specifications.*



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DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING COMPANY DIVISION
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YOU'LL FIND THOR

Used with a sheeting driver attachment, the Thor No. 25 Breaker quickly drives wood or steel sheeting up to 3" thick.

Thor No. 25 Paving Breakers do fast demolition on pavements, walls, columns, piers, foundations, etc.

With clay spade attachment, a versatile Thor Breaker saves time and effort in trenching operations.

Self-priming Thor Sump Pumps, with centrifugal impeller-type construction, operate with high efficiency in oil, sludge, sewage or dirty water.

Thor Pneumatic and Electric Saws cut all types of lumber on the job.

TOOLS ON MORE JOBS

with **Thor** **JOBS MOVE FASTER!**

Thor No. 75 Rock Drill—one in a range of sizes for general purpose drilling in all rock formations.

Thor contractors tool accessories for digging, tamping rock breaking, asphalt cutting, driving, sheeting etc.

Thor Tools appear on more jobs because contractors equipped with Thor can bid for more jobs—and get more jobs done faster! They can figure ahead on practically doubling the output of their gangs for any job with the extra power and handling ease of Thor Tools that naturally get more work done quicker. Figure Thor in your '47 plans—call your Thor dealer today for complete information.

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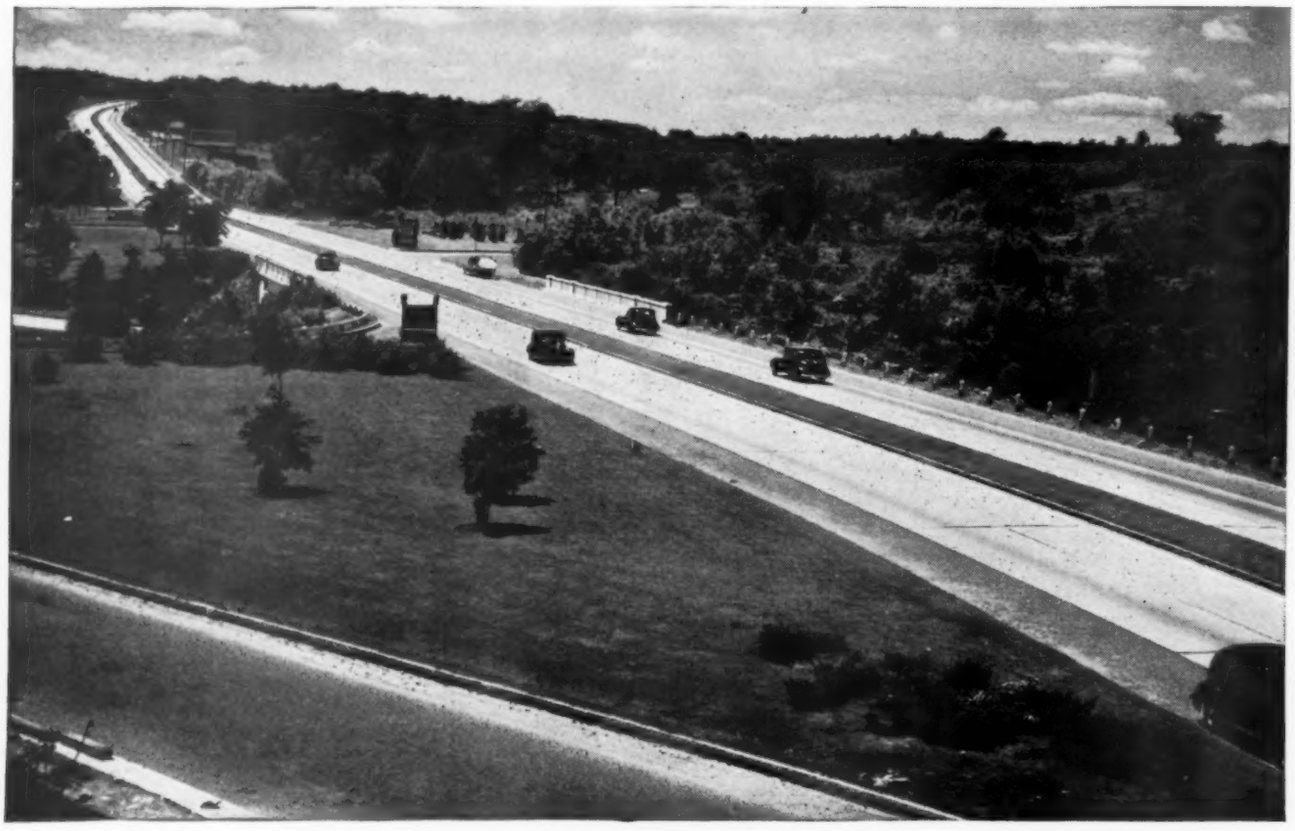
Thor **PORTABLE POWER TOOLS**

Control Weeds Effectively—Economically!



2-4 Dow Weed Killer

Low Cost. Highly recommended for killing broadleafed weeds in lawns to beautify parks, streets, and company buildings. Not harmful to most grasses. Available both as a liquid and a powder.

Esteron 44—a powerful 2, 4-D Weed Killer

Especially useful against many types of woody plants, such as wild rose, poison ivy, mesquite and sprouts of many other woody species. Ideal for use on cut-over land along rights of way. Not harmful to most grasses.

Dow Contact Weed Killer

"Chemical Mower" for weeds along canals, ditch banks, fences and roads. Kills most annuals completely. Destroys all weeds and grass above ground, leaves roots to prevent soil erosion.

Economical and effective control of many stubborn, troublesome weeds along highways and rights of way is now possible through proper application of the right Dow Weed Killer!

Maintenance men everywhere are pleased when field crews report that *spraying* weeds to death is so *simple*—saves so much *time*—gets such excellent *results!* And when the cost figures come in—when the dollars and cents savings prove the economy of chemical weed control—that settles it! No more mowing, digging or hoeing—it's Dow Weed Killer for *better* weed control!

Results of many tests and successful applications are available for your inspection. The complete story of Dow Weed Killers is yours for the asking—without obligation. Consult your usual source of supply—or write to Dow direct. Get the facts!

Cut maintenance costs with—

DOW WEED KILLERS

AGRICULTURAL CHEMICAL DIVISION

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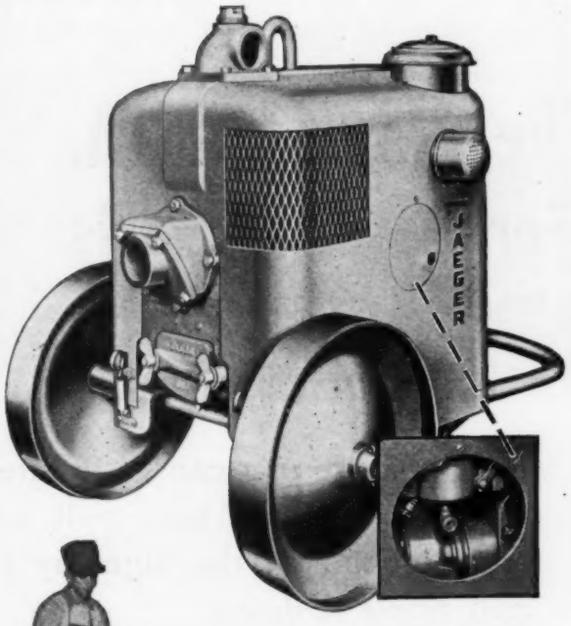
DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

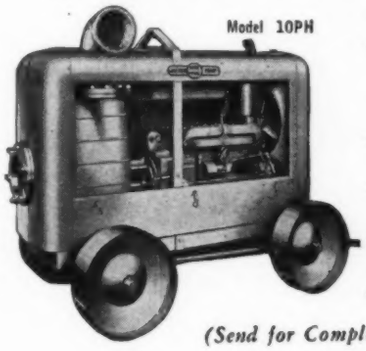
PROTECTED YET FULLY ACCESSIBLE



Instant-opening side panels. Enclosures also lift off or swing open for complete access.

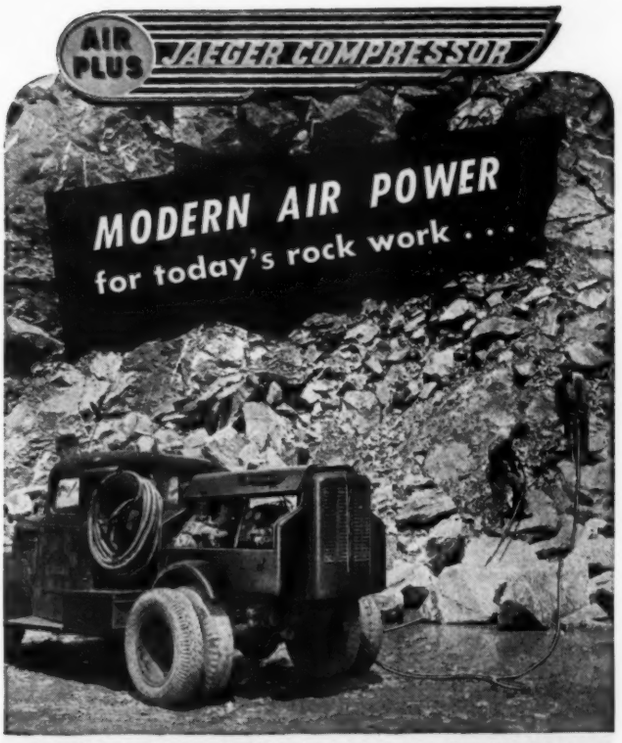
JAEGER keeps the engine as efficient as the pump

These latest model Jaegers handle more water because they keep it from your sparkplugs, carburetor and the crankcase, insure a dry, quick-starting and efficient engine to match the efficiency and long life of your Jaeger "Sure Prime" pump. Enclosures on small pumps swiftly lift off when needed. On larger models the big Jaeger housing permits far easier accessibility to all engine parts. Add this to many other reasons why Jaeger outsells and out-performs all other pumps.



- **More efficient power**
- **Inherent priming action plus "jet" priming — faster and doubly sure.**
- **Replaceable liners or seal rings in all sizes.**
- **All seals accessible for quick inspection.**
- **Micrometer workmanship.**
- **Certified performance.**

(Send for Complete Catalog P-45.)



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SELL and SERVICE JAEGER COMPRESSORS

and the FINEST TOOLS to go with them.

Send for name of nearest distributor and catalog JC-5, the up-to-date buyers guide for compressors of 60 to 500 ft. size — trailer, truck or tractor-mounted.

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The New L.C.M.
For Power Wheels
Used in Logging, Construction, Mining

SELF CLEANING
Notice that the voids are wider at the shoulder than the center. Because of this graduated design, when the tire is under deflection the channels force out the stones, rocks and mud with every turn of the wheels.

LONGER WEARING
30% more rubber than any General tire ever built. Massive shoulders, reinforced with extra thick rubber give maximum resistance to cuts, snags and bruises. More rayon cords in every inch of body for even greater strength.

COOL RUNNING
Special contoured shoulder reduces load and contact on the shoulder area, thus materially reducing heat generation. Special shoulder design also allows the tire to slip away from jutting rocks which would cut other tires.

Here is a tire that can go in after the load, take the load, pull out and highball on the highway to mill, tipple or dump.

It's designed for through tracking and straight rolling . . . a real, specially designed on and off the highway, 2 in 1 tire.

You'll find it hard to heat up, hard to beat up and harder to wear out. That's the way it's designed and built . . . after years of study and months of testing on tough operations. See the L. C. M. at your regular General dealer and see the difference.

The GENERAL TIRE and RUBBER CO.

TWO GREAT NEW TIRES

The New EARTH-MOVER
For Free-Rolling Wheels
Where High Flotation is a Factor

It takes a tire with high deflection to get good flotation, to stand up and roll in soft ground.

The ability to *stand up and roll* when it's sticky is built into this newly designed, thoroughly tested General. It not only rides *higher,* but also rolls more easily, *uses less energy* from the power wheels.

Watch it work and you'll see more yards of dirt move faster. Watch it absorb obstructions that would bruise a hard tire. And, because it's tough, Top Quality throughout and built on General's famous shock absorber principle, it lasts longer.

TAMPING ACTION
Each notched square of the tread tamps down the dirt as it meets the ground, packs it hard; even packs the driving tracks where the tire follows the driving wheels. No surface disruption or distortion.

SNAG RESISTANT
Extra tough sidewall and tread resist cutting and snagging. Big margins of *plus* rubber content in the tread shoulder and sidewall armor the tire against sharp rocks and other obstacles found on construction jobs.

STRONGER BODY
An exclusive method of truck tire building allows General to put in more core cords of rayon in every inch . . . making the tire body much sturdier . . . much less subject to fatigue . . . much more flexible.

The GENERAL
TRUCK TIRE

. . . AKRON 1, OHIO

H. B. Zachry, San Antonio, Texas, is well ahead of schedule in the construction of a 12-mile-long earthen dam for flood control purposes near Addicks, Harris County, Texas. This $2,775,000 job involves moving 7,000,000 yds. of earth.

Gulf Products and Fine Service help contractor

keep ahead of schedule on big earthen dam project

"IN spite of bad weather conditions, we're well ahead of schedule on this job—thanks in a large measure to Gulf products and fine service," says Perry Jefferies, Job Superintendent. "Proper lubrication and top-notch fuel performance have enabled us to push equipment to the limit without delays from mechanical troubles."

Working as a team, Gulf quality lubricants and fuels help keep contractor's equipment on the job and operating efficiently day in and day out. Added up, this kind of equipment performance means greater yardage, lower maintenance costs, and a speedier job.

Join now the list of leading contractors who have adopted Gulf quality lubricants and fuels as basic profit insurance. They are quickly available to you through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

GULF

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ANOTHER GREAT TRAXCAVATOR

REG. U. S. PAT. OFF.

Digs • Grades • Loads
Carries • Bulldozes
Backfills • Spreads
Casts • Levels • Strips

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Digs Toughest Soils
Year-Around Utility
High Production
Low Yardage Costs
Complete Visibility
Fast, Easy Operation

HERE'S the newest member of the famous TRAXCAVATOR family, the Model T-6 — climax of 20 years of tractor-shovel building . . . Brings to excavating, dirt-moving and material-handling fields, a new measure of multi-purpose utility and low production costs.

It mounts on the "Caterpillar" D6 tractor and is engineered to utilize most efficiently the full power, speed and work capacity of that renowned tractor . . . over 16,000 pounds of tractive effort that digs full loads in toughest soils . . . quick reverse, unequalled visibility and sure-footed balance that spells high-speed, low-cost digging, loading, grading and moving of earth or loose materials . . . ability to load big hauling units or small dump trucks with equal ease.

TRAXCAVATORS are the only full and complete line of tractor-excavators . . . there's a size for every job and purpose . . . and both TRAXCAVATORS and tractors are sold and serviced by your TRACKSON-"Caterpillar" dealer. See him today about the T-6 and other sizes of TRAXCAVATORS, or write direct for facts to TRACKSON COMPANY, Dept. RS-37, Milwaukee 1, Wisconsin.

TRAXCAVATORS ARE PROFIT-MAKERS

Operation "Mudhole"

You can "outlaw" costly road surface break-ups by installing ARMCO Perforated Pipe. It pays off in firm, smooth pavements, less maintenance work and reduced costs.

Here is a plan of attack that routes sub-surface water, arch-enemy of good highways, and keeps "him" on the run. It is simple and sure. Just drain the water out and keep it out. You can do this with ARMCO Perforated Pipe.

You'll find ARMCO Pipe has many advantages for installing complete highway subdrainage systems, or for patching up trouble wherever it occurs. This pipe is light in weight for low-cost hauling and handling. Long lengths, tightly joined with sturdy band couplers, are easily and quickly installed by unskilled workmen. The job moves fast and installation costs are low.

Breakage is no problem either. Your subdrainage system has *proved strength* to resist crushing, cracking or disjointing under the impact and weight of heavy loads. Shifting soils and severe frost action have no effect on ARMCO Pipe.

With even the best of road surfaces you need a firm, dry foundation. ARMCO Perforated Pipe will give it to you. It stabilizes subgrades, reduces annual maintenance expense, insures freedom from failure. Write for complete information. Armco Drainage & Metal Products, Inc., 1175 Curtis Street, Middletown, Ohio. Offices in principal cities.

ARMCO

ARMCO PERFORATED PIPE

A ROCK EATER

says BILL REES, Monroe, Wisconsin

More than 2 yards of ¾" per minute with Universal 293-Q Pacemaker Senior Portable Quarry Plant

"In my opinion, the Universal 293-Q Pacemaker is the finest portable rock plant built. It consistently produces 125 yards of ¾" material per hour from rock with a wearing test of 41.3. It can be moved from the quarry for dynamite shots and be back in operation in 22 minutes. On one occasion we moved the entire plant 28 miles and were set up and crushing to capacity in 4 hours. We have produced over 300,000 tons with no expense other than normal operation and maintenance costs which have been unusually low."

"Stream-Flo" Engineering and Twin-Dual Rolls Provide Amazing Capacity at Low Cost Per Ton

Featuring three stages of reduction with only two crushers, the 293-Q Pacemaker shovel-loads direct from quarry, increasing profits by eliminating the expense of quarry trucks and costly ramps. Once you start feeding rock into its sturdy shovel-loading hopper, material flows in a steady stream to save time and cut operating costs. The complete plant consists of a jaw crusher, Twin-Dual roll crusher, 2½-deck gyrating screen, apron feeder, bar grizzly and by-pass, under conveyor, Rotovator, and return conveyor. These units, combined with all auxiliaries necessary in a smooth, well-balanced plant, are mounted on a dual pneumatic tired gooseneck truck equipped with mechanical brakes and rear wheel equalizers.

For capacity to tackle largest jobs, for portability to handle small contracts profitably, investigate the Universal 293-Q Pacemaker now. Learn how "Stream-Flo" Engineering gives you higher capacity, ready portability, and lower costs per ton. Your nearby Universal distributor has the facts or write for full information.

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WRITE FOR BULLETIN No. 31

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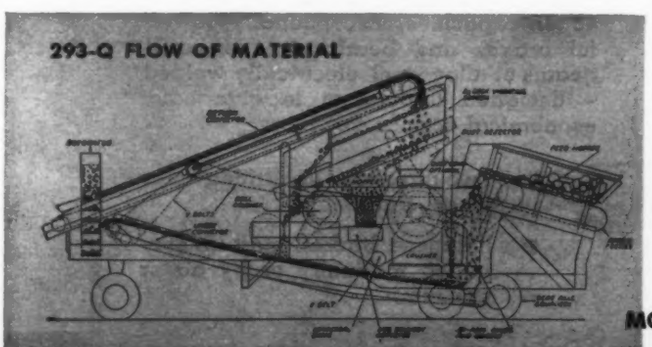

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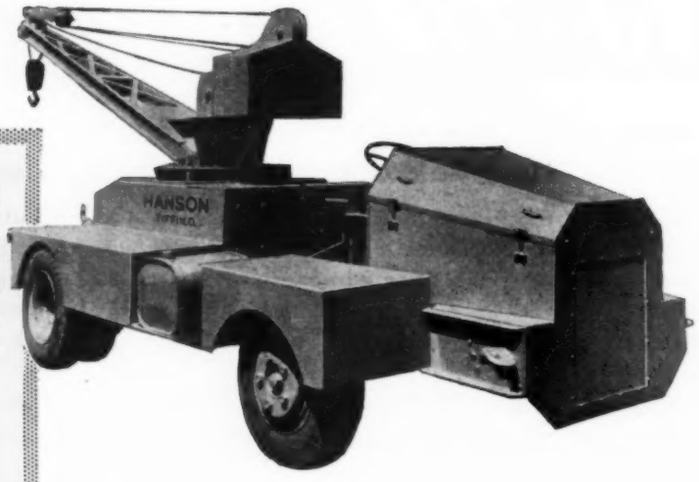
MORE TONS PER HOUR—LESS COST PER TON

ENGINEERS AND BUILDERS OF "STREAM-FLO" ROCK, GRAVEL, AND LIME PLANTS—SCREENING AND WASHING PLANTS—CONVEYORS—APRON FEEDERS

HANSON

MANUFACTURES *High-Grade, Dependable* CONTRACTORS' EQUIPMENT

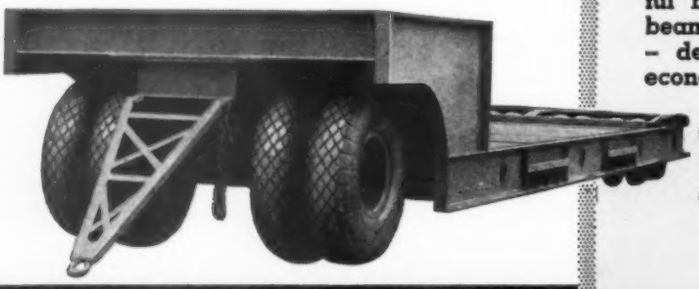


● YARD AND DOCK CRANE

The speedy, handy, newest member in the HANSON material handling family. Was the exclusive choice of the armed forces. Hundreds of uses around railroad, shipyard, factory, steel mill and fabricating plant.

- Two ton lift -- four ton carry.
- One-man operated, speedy, easily maneuvered.
- Full revolving crane, loads in 270° arc.

Write for detailed specifications.



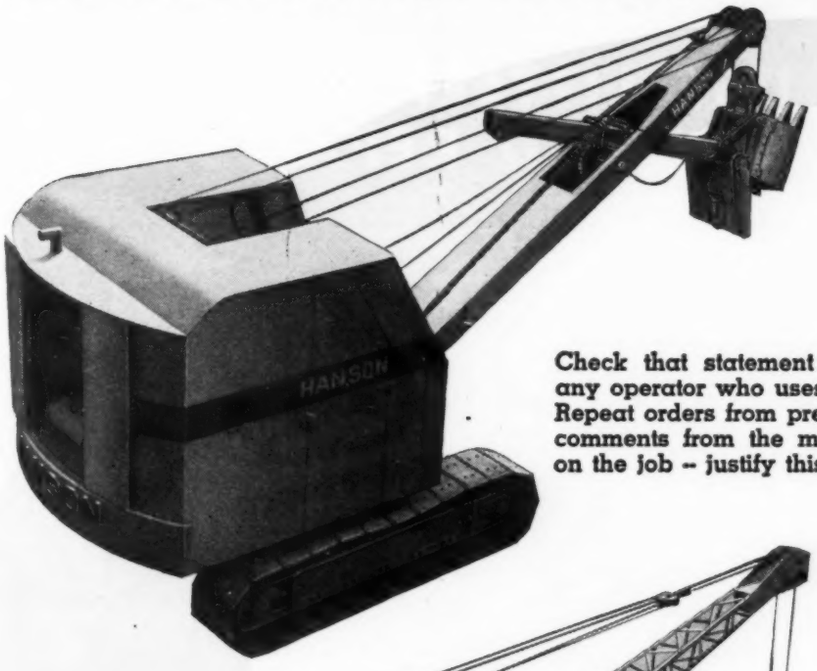
● HEAVY-DUTY EQUIPMENT TRAILER

Goose-neck type, either "semi-" or "full". Five sizes, 10, 15, 20, 30 and 40 ton capacities. Exceptionally powerful brakes and bearings; massive H beams of alloy steel, electrically welded -- designed throughout to give safe, economical service for years.

- Two-direction oscillating rear wheel units.
- Balanced brakes, may be controlled manually or by air or vacuum.

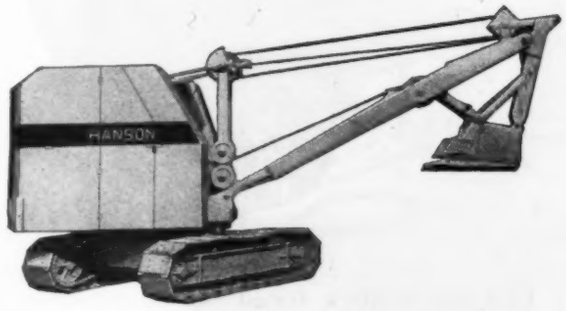
HANSON CLUTCH & MACHINERY COMPANY TIFFIN, OHIO

YOU GET MORE WORK DONE.. with a HANSON



Check that statement against the record. Ask any operator who uses one of the new Hansons. Repeat orders from present users and unsolicited comments from the men who pull the levers -- on the job -- justify this claim.

Two sizes: Model 31 - ⅜ cu. yd. as shovel or 4½ tons as crane.
Model 41 - ½ cu. yd. as shovel or 6½ tons as crane.
Basic unit easily and quickly converted in the field to shovel, trench-hoe, crane, clamshell or drag-line.

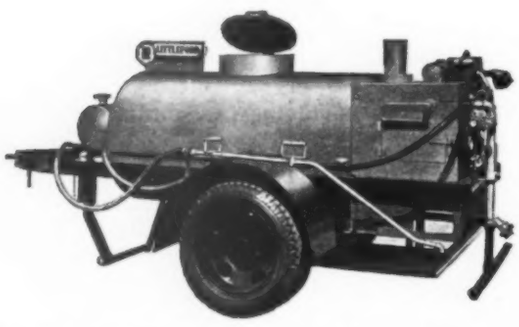


FEATURES: Full revolving . . . chain crowd . . . fully enclosed steel cab . . . welded steel construction . . . ball or roller bearings at all vital points . . . air controlled steering . . . disc type clutches on swing . . . internal expansion, booster type clutches on hoist and crowd . . . all clutches easily and quickly relined without removing shaft assemblies . . . extra long crawlers . . . heavy duty industrial type motor . . . gasoline or diesel.

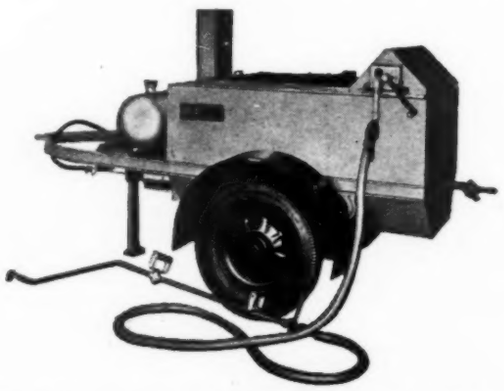
Write for detailed specifications, catalog R-37.

HANSON CLUTCH AND MACHINERY COMPANY TIFFIN, OHIO

Holes in black top are as inevitable as winter, and the best and cheapest way is to get on them quickly with the finest repair equipment anywhere available—Littleford. Put Littleford's Trail-O-Roller on patch work and the holes will soon disappear. For this compact little number is motorized and portable, converts from rolling to traveling, or back, in two minutes; trails as fast as you drive a truck; compaction as great as five ton tandem! *There's* efficiency! Combine that with Littleford heating Kettle and 101 Utility Spray Tank, and you're ready for the toughest road job that winter can throw at anybody!



Littleford 101 Utility Spray Tank is combination of three units: Spray bar for spraying, hand spray for patch work, pouring pot outlet for filling cracks.



Littleford 84-HD is fastest heating kettle made; double heat circulation and screened reservoir. These patented features give fast, efficient, economical operation.

LB — BLACK TOP ROAD MAINTENANCE EQUIPMENT — SINCE · 1900

LITTLEFORD

LITTLEFORD BROS., Inc.

454 E. PEARL ST., CINCINNATI 2, OHIO

PREFERRED!

—for RELIABILITY . . . for ECONOMY . . . and for UNIVERSAL FORD SERVICE!

Whether you *design* and *build* engine-powered industrial equipment, *sell* it, or *use* it, here is a fact so vital that it deserves your most earnest attention:

Nearly all such machinery—whether pumps, electric generating plants, compressors, power units, saw rigs, ventilating and spraying units, or other portable equipment—by its very nature, will spend its service life on jobs where it's "on its own"—where reliability and ready maintenance service are all-important—and where the transportation of motor fuel makes gasoline economy a constant concern.

FORD-BUILT ENGINES PROVIDE UNIQUE ADVANTAGES IN SUCH SERVICE. Ford engine reliability is known and respected the world over. Millions of Ford vehicle owners and automotive mechanics are thoroughly familiar with Ford engines. Ford economy is famous. And Authorized Ford Service is available in every community of any importance.

Certainly, then, if your power requirements come within the range of 40 to 100 horsepower, you could not choose an engine which would offer you as many positive advantages as Ford.

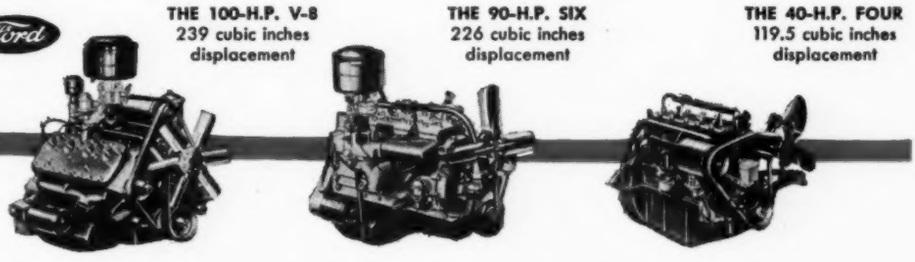
Three Ford-built engines are now available, as shown below. You can buy them singly or in quantity, through any Ford Dealer or from Ford Motor Company. For detailed specifications and dimensional data, write—

FORD MOTOR COMPANY
Industrial and Marine Engine Department
3513 SCHAEFER ROAD, DEARBORN, MICHIGAN

THE 100-H.P. V-8
239 cubic inches displacement

THE 90-H.P. SIX
226 cubic inches displacement

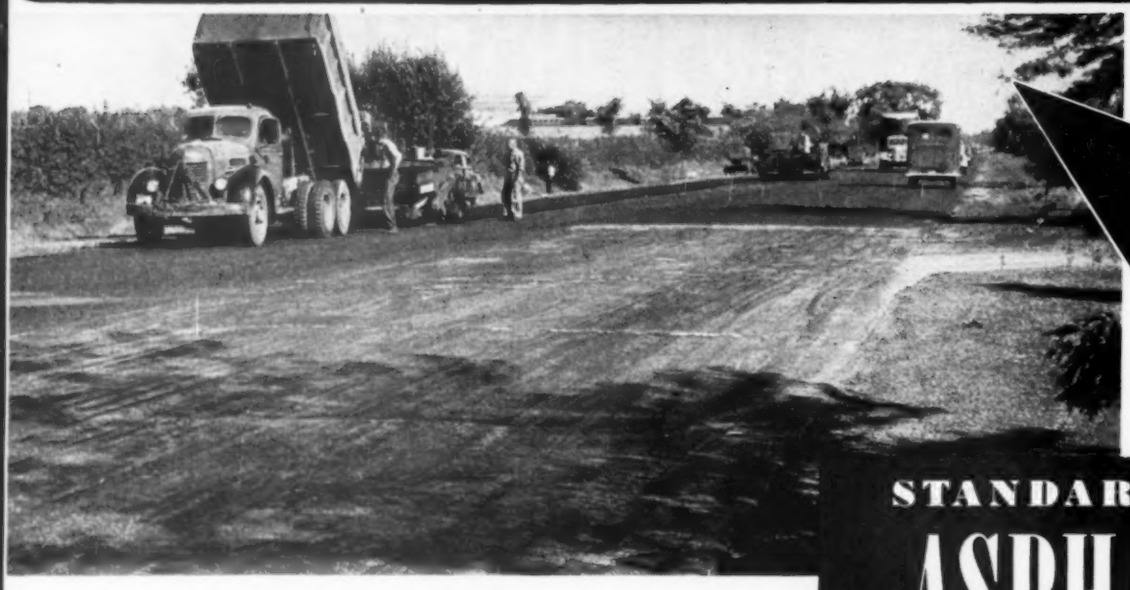
THE 40-H.P. FOUR
119.5 cubic inches displacement



FORD-BUILT ENGINES

FOR INDUSTRIAL AND MARINE POWER

Make Street and Highway Funds Go Farther



...Resurface with STANDARD OIL ASPHALT

Asphalt resurfacing saves time and money in restoring to city streets and highways an easy-riding, like-new surface. Whether worn pavements are of concrete, brick or asphalt, resurfacing is done quickly and easily with the minimum of manpower and equipment. There is no interruption to traffic—one lane can be worked at a time.

On new roads or widening jobs also, asphalt is economical. Usually local aggregates can be used with local, unskilled labor doing the work. Put asphalt first in your 1947 road building plans.

If you are located in the Middle West, a Standard Oil Asphalt Representative in your locality will be glad to discuss details of the methods and procedure followed by other highway departments now using asphalt to build up and to keep up their highway systems. Call the local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

Motor Graders take the toughest going—meet the toughest steering conditions . . . wade through heavy earth . . . spread road materials . . . dig and clean out ditches . . . uproot old pavement. Travel is frequently very slow. Every condition is present to make steering difficult.

Caterpillar uses Gemmer Steering equipped with the Gemmer "Anti-Kick" in their Motor Graders. Gemmer high efficiency . . . smooth easy transfer of power make steering easy. The "Anti-Kick", non reversing feature keeps road reaction from reaching the operator through the steering wheel.

Gemmer Steering is easier, more efficient in any vehicle, from slow moving off the road types to high speed highway classifications. Gemmer Steering is dependable—lasts the life of the vehicle with reasonable care.

3020

CATERPILLAR TRACTOR CO
PEORIA ILL

TO
GEMMER MANUFACTURING COMPANY
IN APPRECIATION OF SERVICE
TO "CATERPILLAR" SINCE
1938

GEMMER
MANUFACTURING COMPANY
6400 MT. ELLIOTT ★ DETROIT 11, MICHIGAN

THIS DRAGLINE COST $36,000

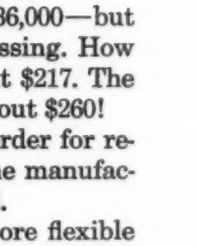
. . . but it can't work!

● This is a dragline and it cost approximately $36,000—but it can't do a lick of work because the wire rope is missing. How much does the rope cost? Ordinary wire rope—about $217. The best wire rope—Preformed Improved Plow Steel—about $260!

Specify Preformed Improved Plow Steel when you order for replacement. And when you buy such a machine, tell the manufacturer to equip it with Preformed Improved Plow Steel.

It lasts longer, is easier and safer to handle; it's more flexible and spools better.

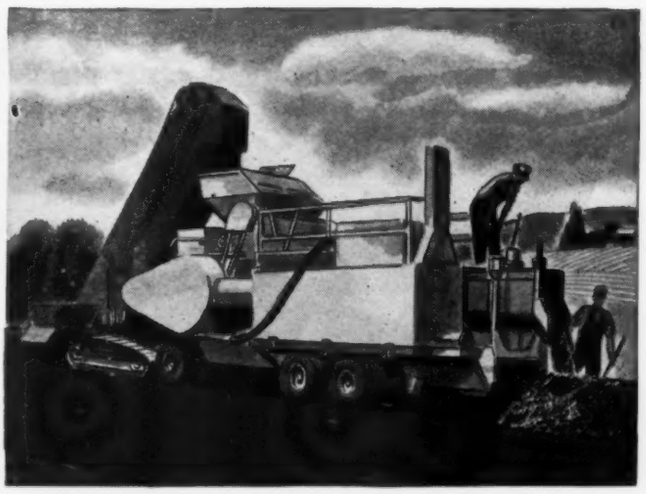
WRITE FOR FREE COPY of helpful book about Preformed. Address: Preformed Wire Rope Information Bureau, 520 North Michigan Ave., Chicago 11.



ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

HANDLES EASIER - LASTS LONGER

Blackhawk Hydraulics are ON THE ROAD



. . . Under Finger-Tip Control

for easy operation and accurate control

TOUGH road work demands the rugged, dependable, safe performance of Blackhawk Hydraulic Controls. Fingertip pressure on a conveniently located lever puts tons of actuating power to work, lifting and lowering—safely, speedily and accurately. Blackhawk pumps, rams and valves are built to take it and to dish it out. Many leading road equipment manufacturers build with Blackhawk Controls as standard equipment. You'll find it "easy going" on the road if you specify Blackhawk Hydraulics on all your equipment. For complete information on the advantages of Blackhawk Hydraulic Controls, write your equipment manufacturer.

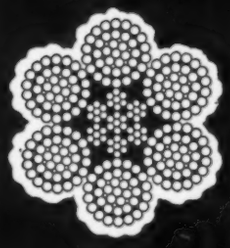
A Product of **BLACKHAWK MFG. CO., Dept. RS, Milwaukee 1, Wisconsin**

Power-Driven P-104
Power-Packer Pump—belt or gear driven—control valve is operated from cab. Compact, easily installed.

Hand Operated P-60
Power-Packer Pump—mounts in cab. Blackhawk is also the source for RAMS and VALVES used with these pumps.

BLACKHAWK
Hydraulic EQUIPMENT

For Strength plus Flexibility



UPSON-WALTON
6x37 LAYRITE WIRE ROPE

FOR overhead traveling cranes in steel mills, for winch lines and slings, for holding and closing lines on grab buckets, for towing hawsers and mining machine ropes—industry after industry has conditions where high strength must be combined with great flexibility.

Wherever drum or sheave diameters are small, or where reverse or acute bends are encountered, fatigue stresses are high. For this type of service Upson-Walton 6 x 37 Perfection Layrite Cable is best because the individual wires in the strand are finer; therefore they are more flexible and better able to resist fatigue stresses. In addition, the greater number of fine wires in the rope gives it a greater metallic area, so strength is still high.

Hemp center or, where crushing conditions are extremely severe, IWRC (independent wire rope center).

Specify Upson-Walton 6 x 37 when you need maximum flexibility plus a high degree of strength.

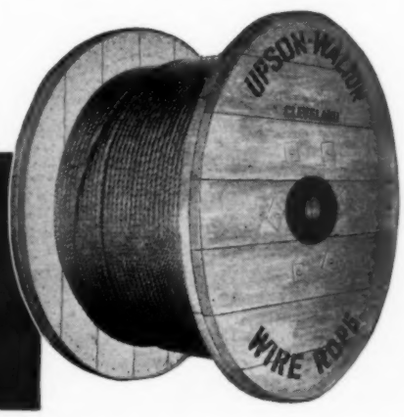
Specify Perfection grade because this improved plow steel is the strongest and toughest and most resistant to wear of all the grades of wire used to make rope.

Specify Layrite because this fine *pre*formed wire rope results in longer life, greater safety and greater economy.

Upson-Walton 6 x 37 Perfection Layrite is worth specifying, and always up to specifications!

Established 1871

Copyright 1946—The Upson-Walton Company



THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 — 737 W. Van Buren Street, Chicago 7 — 241 Oliver Building, Pittsburgh 22

Super Service

ON ALL TYPES OF JOBS!

½ and ¾ Yard
EXCAVATORS

5 and 10 TON
CRANES

Every UNIT is FULLY CONVERTIBLE

Regardless of whether your job calls for a shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller, a UNIT machine easily "fills the bill"! For UNIT is convertible to ANY attachment and gives an excellent account of itself on ALL types of service. The change from one attachment to the other can easily and quickly be made on the job, by any ordinary mechanic. UNIT exclusive features include: Automatic traction brakes... Disc type clutches... One-piece cast gear case and above all, UNIT's safety-promoting FULL VISION CAB.

CONTACT FACTORY DIRECT FOR PRICE AND DELIVERY

UNIT CRANE & SHOVEL CORP. 6407 WEST BURNHAM STREET MILWAUKEE 14, WIS., U.S.A.

HOT OIL FAST!
..with Less FUEL..WATER..WORK

Handle that road oiling contract more profitably with a Cleaver-Brooks Tank Car Heater

The quicker you get the oil or asphalt in the tank car on the siding up to application temperature and flowing into the distributors—the faster your road crews can get going and finish the job.

With a Cleaver-Brooks Tank Car Heater you can have hot, dry steam flowing to car coils from a cold start in 20 minutes or less. And you can keep going all day with the least work and bother because a Cleaver-Brooks Tank Car Heater requires less fuel and water.

Perfected — highly efficient — you can tow it with car or truck to tank car siding, construction site, material yard or other locations where you need steam.

The famous Cleaver-Brooks four-pass fuel travel means low fuel consumption; the turbine type condensate return system cuts water loss — every drop of condensate goes back to the heater under pressure.

Built for full capacity — full time work — Cleaver-Brooks Tank Car Heaters will give you the most in production hours on the job. Write for bulletins and complete information.

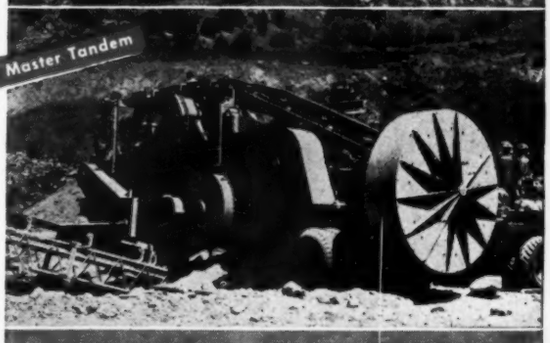
CLEAVER-BROOKS COMPANY
5106 North 33rd Street, Milwaukee 9, Wisconsin

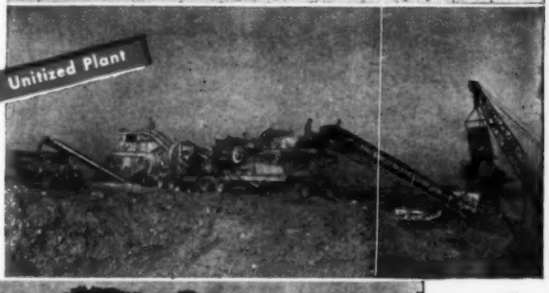
Write On Your Business Letterhead . . .
For the Bituminous — mix Calculator — a ready reference slide rule showing weight of mix needed in lbs. and tons in relation to width and depth of area to be covered.

Cleaver-Brooks

PIONEERS AND ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM-PLANTS





$7½ billions of heavy construction in 1947! Millions and millions of tons of aggregate will be needed.

Here's the line of modern, portable crushing and screening plants that will help you make more money for producing that aggregate. Every unit is made of the finest possible material and skillfully engineered to assure long, trouble-free operation, low-cost production and flexibility to meet every operating condition.

- 100 to 150 tons per hour of 1" material are easy for the big Cedarapids Master Tandem.
- The Cedarapids Junior Tandem is similar to the Master but smaller in size.
- The Cedarapids Pitmaster is our smallest portable straightline crushing plant but owners say there's nothing small about its production.
- The Cedarapids Unitized Plant is the most versatile, portable crushing, screening and washing plant ever offered. Will handle rock or gravel, dry or washed—with almost any desired capacity.
- The Cedarapids Portable Hammermill plant is the ideal unit for large production of agstone and road stone.

See your nearest Cedarapids dealer for details. When you buy a crushing plant — buy the best — buy Cedarapids.

THE IOWA LINE

of Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
CONTINUOUS MIX TYPE ASPHALT PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
KUBIT IMPACT BREAKERS
HAMMERMILLS

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.
Cedarapids
Built by IOWA

Chiloquin, Oregon, Job of R. A. Heintz Construction Company, Portland, Oregon

—with a fleet of Wooldridge Terra-Cobras

WOOLDRIDGE TERRA-COBRAS employ the same Bowl features as Wooldridge "Terra-Clipper" tractor-drawn Scrapers

Working on a 7.5 mile stretch of a new 40 mile highway, which will by-pass the crooked snowy Sun Mountain grade, just North of Fort Klamath, Oregon, Wooldridge Terra-Cobras are handling full loads of volcanic boulders, decomposed lava and cinder soil on an 8 minute round-trip cycle, over a distance of 6400 feet. 40 to 60 seconds loading and 30 seconds spreading in distances up to 100 feet contribute to consistent and continuous speed of haul—down and back a 3% grade. Ample traction and power plus positive two-wheel steering insures sure-footed travel at maximum speed every inch of the way. Flexibility of travel and effortless control saves equipment and operator fatigue. To figure on lower yardage costs, figure on using Wooldridge Terra-Cobras. Investigate fully today.

Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

- High Speed EARTHMOVERS
- Tractor-drawn SCRAPERS
- BULLDOZERS
- TRAILBUILDERS
- RIPPERS
- POWER CONTROLS

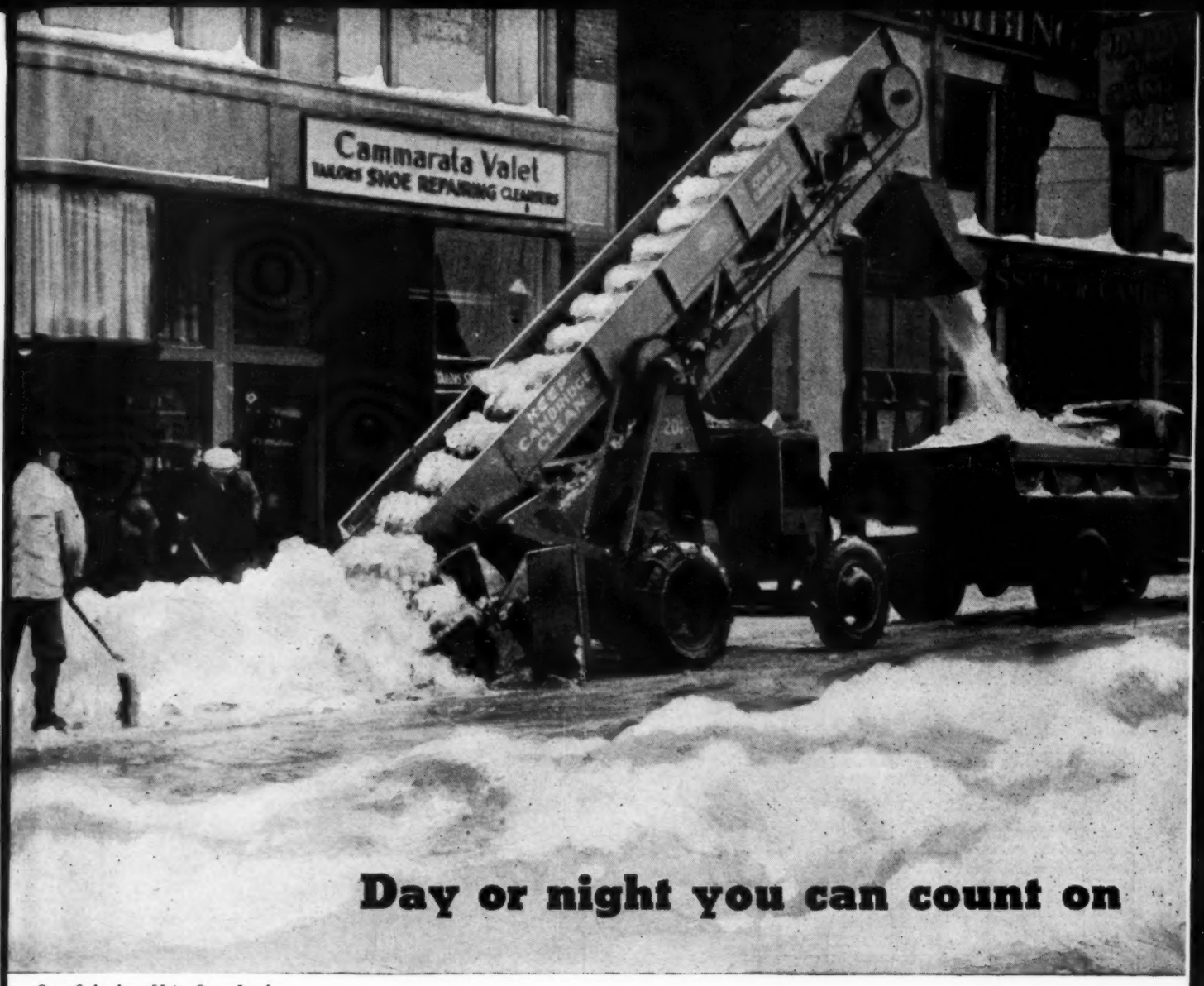
WOOLDRIDGE

TERRA COBRA

HIGH SPEED-SELF PROPELLED

EARTHMOVERS

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA
NATIONWIDE SERVICE



Day or night you can count on

One of the three Haiss Snow Loaders owned by The City of Cambridge, Mass.

Haiss Snow Loaders

Haiss snow loaders fill trucks fast, cleaning up congested traffic areas in a few hours.

They are designed for 24-hour operation in very cold weather. Communities which have a big snow removal problem run them day and night. These machines are highly mobile, and get about quickly between working locations under their own power.

Each Haiss snow loader does the work of 80 men, and loads 15 yards a minute. It reduces truck rentals by $200 to $300 or more per 8-hour shift.

Because of the chopping action of the propeller blades, and the positive upward lift of the conveyor scoops, this rugged machine is thoroughly dependable in hard and frozen snow.

Our nearest sales representative will gladly arrange for you to see one in action.

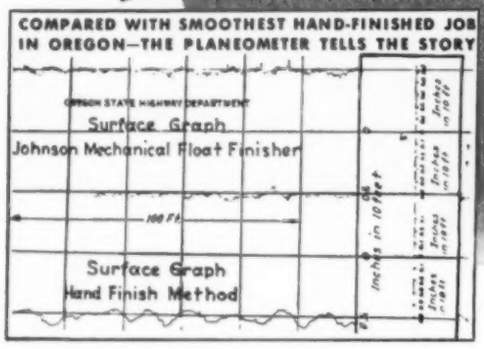
* * *

Haiss is now a wholly-owned subsidiary of Pettibone Mulliken Corporation of Chicago. With new management and much larger resources, Haiss can now do a still better job for its customers... better machines and servicing, larger production, quicker deliveries.

Haiss specializes in equipment to load bulk materials... snow, sand, gravel, stone, coal, top-soil, etc.

Its machines are money-makers for their owners.

GEORGE HAISS MANUFACTURING CO.
381 Canal Place
New York 51, N. Y.


COMPARED WITH SMOOTHEST HAND-FINISHED JOB IN OREGON—THE PLANEOMETER TELLS THE STORY
OREGON STATE HIGHWAY DEPARTMENT
Surface Graph
Johnson Mechanical Float Finisher
100 Ft.
Surface Graph
Hand Finish Method
Inches in 10 Feet

SMOOTHNESS TEST

Illustrating the remarkable finishing done by the Johnson Float Finisher, these graphs, made by the Oregon State Highway Commission, show a variation of less than .05 of an inch per 10 feet—.02 less than state requirements.

JOHNSON *float* FINISHER

INCREASE DAILY PRODUCTION of your paving crew with a Johnson Float Finisher by eliminating the bottleneck of finishing operations. Here is a mechanical finisher that completely *float finishes* pavement and makes it ready for edging and jointing. No voids or pockets are left! No high spots! No low spots! And no float finishing to do by hand.

Two men — one to operate the Johnson Float Finisher and one to edge and joint — can turn out 2000 to 3000 feet of road surface to a tolerance of .05 of an inch in the length of a 10-foot straight edge.

Authentic data from past performances prove conclusively that the savings in time and labor will pay for a Johnson Float Finisher in less than 25 miles of highway finishing. Standard specifications of many states require the Johnson Float Finisher. Get the facts today! Write for illustrated catalogue.

Write for Catalog

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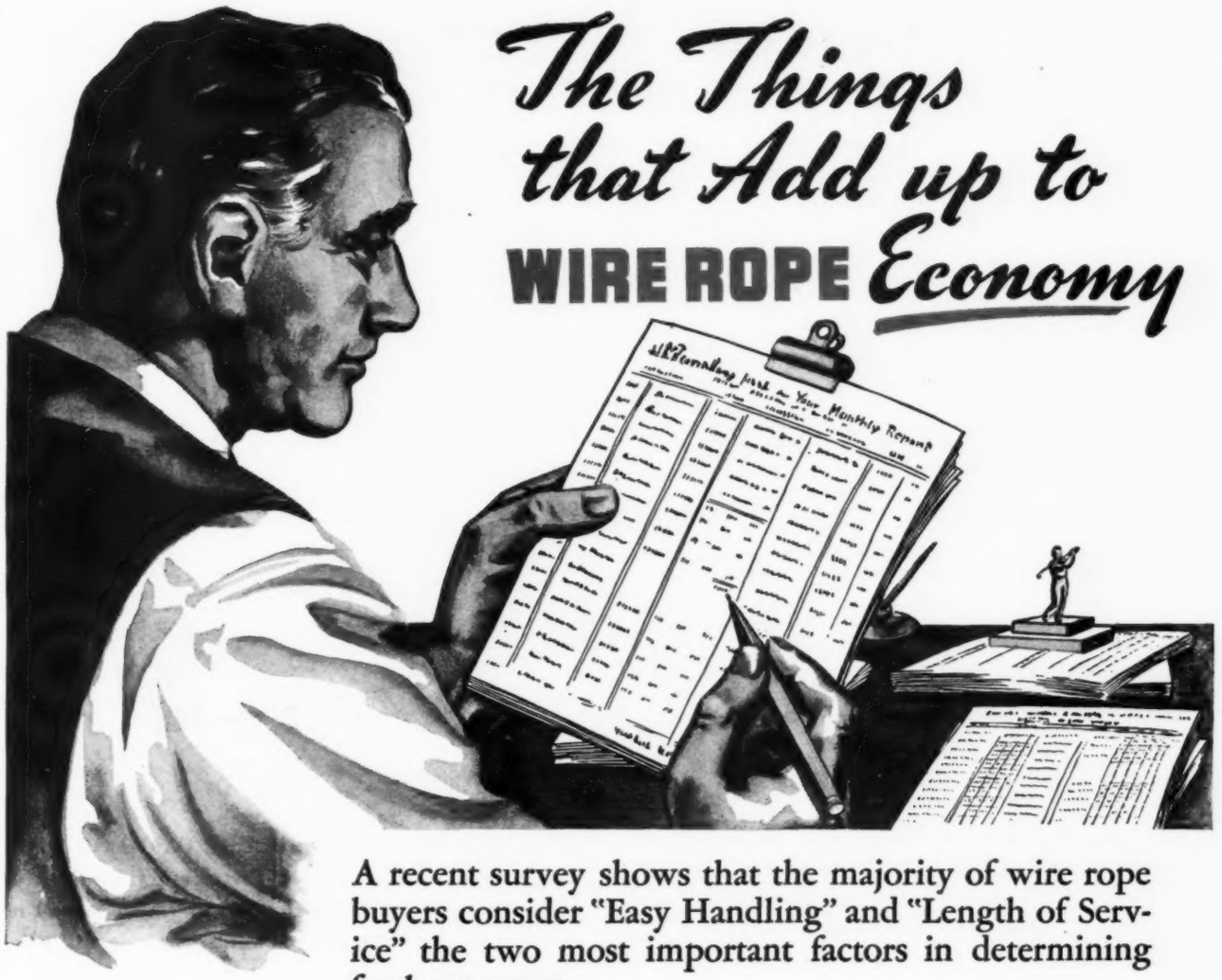
The Things that Add up to WIRE ROPE *Economy*



A recent survey shows that the majority of wire rope buyers consider "Easy Handling" and "Length of Service" the two most important factors in determining final rope cost.

And more and more wire rope users are finding, by actual experience, that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for these two top-ranking features. As it is available in a wide range of constructions – both Round Strand and Flattened Strand – they have *also* found that in "HERCULES" there is a *right rope* for any heavy duty purpose.

If you have not tried Preformed "HERCULES" (Red-Strand) Wire Rope you, too, would like its easy handling, smooth spooling and long life. Give it a chance to *prove* its money saving ability! We invite your inquiries.

"HERCULES"

REG. U.S. PAT. OFF.

RED-STRAND

WIRE ROPE

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

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MORE THAN 100,000 USERS

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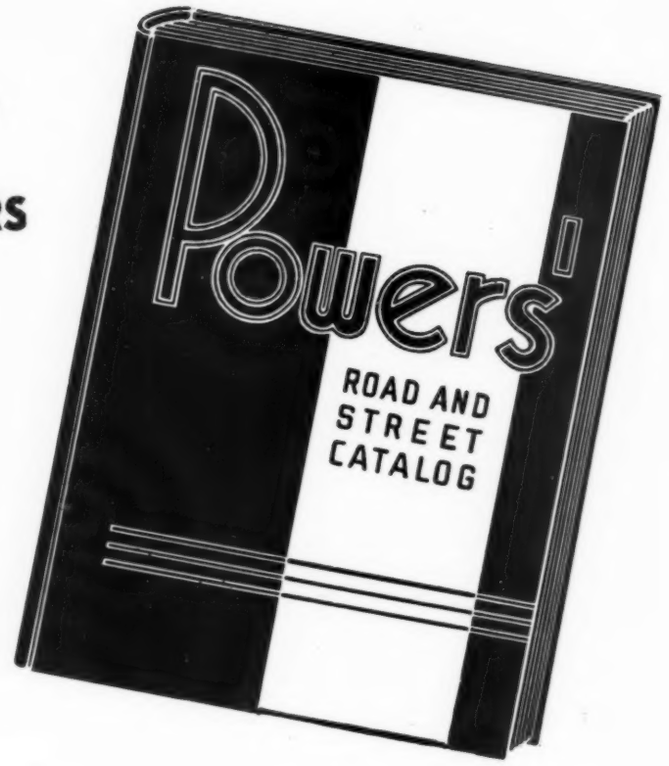


HAVE YOU MADE YOUR RESERVATION?

"Catalog is always within reaching distance. Wouldn't be without it!"

A State Highway Engineer made this comment, but practically the same thing has been said by County, City and Federal Engineers; Road and Street Contractors, and Airport Engineers and Managers.

Comments come pouring in from every part of the field in praise of the Catalog and asking to be kept on the list to receive the next edition.

Requests come from the men who plan and design, construct and maintain the roads and streets of the Nation. They are the State, Federal, City and County Engineers; Chairmen of County Boards; Directors of Public Works; Engineers of National Parks and Forests; and Airport Managers and Engineers. They are the Highway and Heavy Construction Contractors who furnish the major market for the purchase of road building equipment and materials.

POWERS' ROAD AND STREET CATALOG offers the most economical and satisfactory method of placing your Catalog information where it will be constantly available to the man "who wants what he wants when he wants it." Here in one compact reference book is all the necessary information on all types of equipment and materials, indexed for easy reference, with names and addresses of nearest equipment dealers.

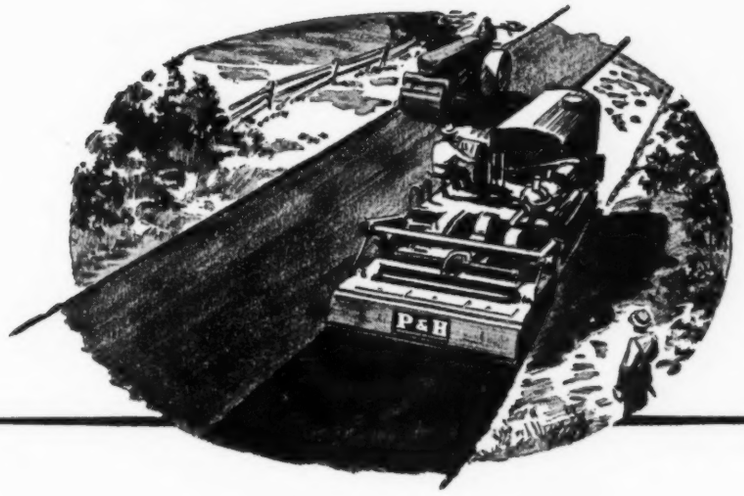
It is estimated that expenditures for maintenance alone this year will reach the billion dollar mark. To this will be added another billion for new construction and improvements. Step up your advertising for increased buying tempo in this huge market for road building and maintenance equipment and supplies.

AUDITED CIRCULATION — FLEXIBLE CCA

Rate card sent upon request

Write for booklet "What Users and Buyers Want to Know About Care and Maintenance of Equipment."

Gillette PUBLISHING COMPANY
22 West Maple St., Chicago 10, Ill.
NEW YORK • CLEVELAND • LOS ANGELES
SAN FRANCISCO



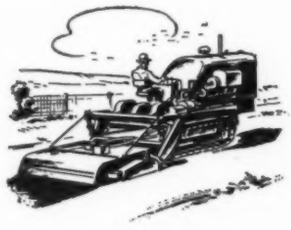
WHAT'S NEW
in Soil Stabilization?

Developments in soil stabilized roads have come rapidly during the past few years. Scientific control of mixtures with native in-place materials now makes it possible to accurately predetermine load carrying capacities.

New speed and efficiency have also entered the picture with the development of the P & H Single Pass Stabilizer. Working under varying local conditions in widely scattered areas, these machines have proved their ability to fulfill these eight basic requirements of processing soils at a single pass — *with any type of admixture:*

1. Control processing depth for accurate proportioning
2. Pulverize the soil thoroughly
3. Blend materials uniformly
4. Create a true sub-grade
5. Disperse the liquid through the entire volume in measured quantity
6. Mix the coated material uniformly
7. Lay the completely processed material in a fluffy, even depth, ready for compaction
8. Do all these things in one pass — at a good rate of speed.

One typical example of P & H Single Pass Stabilizer performance is given at left. Highway Departments and Contractors interested in the most recent developments should write us for complete information.



Soil Bituminous Stabilization in Texas.

Two borrow soils, sand and light clay, were combined and mixed with 4% of RO4 (cut back asphalt) to a depth of 6" in a single operation. The P&H Single Pass Stabilizer's average production was 1264 square yards per hour while processing an 18 foot roadway in two nine foot lines — over a mile of roadway per day of 8½ hours.

P & H HARNISCHFEGER CORPORATION

SINGLE PASS STABILIZERS

4496 West National Avenue
Milwaukee 14, Wisconsin

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • HOISTS • WELDING ELECTRODES • MOTORS

SALE! LAST DAY APRIL 30

TNT

ALL YOU WANT FOR ONLY 7 cents per pound!
Immediate Inspection! Immediate Delivery!

Here is a real opportunity to cut your blasting costs to the bone! WAA is releasing at once its entire stock of easy to store TNT for immediate sale. To get this low price* you need only purchase 30 50-lb. boxes. Easy to handle, stable to store (even under freezing conditions) TNT can be used in all processes where 40 to 60% Dynamite is employed except underground operation. Offers to purchase may be made by letter, wire or personal visit to any of the Regional Offices listed. If your offer is written, mark your envelope "Offer to purchase Trinitrotoluene A-56-2040".

* $.07 per lb., f. o. b. location in crystals, flakes and 1-lb. blocks; $.08 per lb., f. o. b. location in ½ lb. blocks; packaged in 50-lb. wooden or fibre boxes. Also available #10 & 12 blasting caps (required for TNT) and primacord.

DETAILED SALE INFORMATION

This material is offered, as is, subject to inspection by purchaser at location, without expressed or implied warranty except as to title. WAA reserves the right to reject any or all offers, to make awards in whole or in part, or to extend the period of sale. All items subject to prior withdrawal.

Purchasers of TNT are required to observe all applicable laws regulating the sale, use, handling and storage of explosive materials.

10% has been reserved to fill needs of Federal agencies received by April 30th. All other orders received by this date will be filed in following sequence: (a) Veterans of World War II; (b) All other priorities; and (c) Commercial purchasers. Purchaser's order must state thereon: (a) "This order is subject to WAA Standard Conditions of Sale, and all other advertised terms and conditions, and no other terms and conditions shall be binding on War Assets Administration"; and (b) Type of business and level of trade.

WAA OFFICE	½ LB. BLOCKS	1 LB. BLOCKS	CRYSTALS	FLAKES
Birmingham	—	360,039	—	—
Chicago	—	1,225,931	—	—
Cincinnati	28,045	3,544,245	67,500	98,443
Dallas	—	787,020	—	—
Denver	1,247,000	483,841	—	—
Fort Douglas	6,207	6,237,200	—	—
Los Angeles	1,000	966,350	—	—
Minneapolis	209,400	1,485,400	—	—
Nashville	1,751,100	—	—	—
New York	—	178,906	—	—
Omaha	1,068,050	1,848,550	14,250	—
Philadelphia	—	1,212,962	95,950	—
Portland	28,556	2,001,574	—	—
San Francisco	2,053,305	93,060	—	—
	6,392,663	20,425,078	177,700	98,443

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1088-A

INTERNATIONAL Diesel Crawlers

Your Best Bet for EXCAVATING

You can see for yourself in these photographs how the International TD-14 with a bulldozer blade gets on with a basement digging job. Here the average distance from cut to spoil was 60 feet, depth to dig was 6 feet, yardage dug was 420 cubic yards of clay. Total time required was 6½ hours.

Enough said when you say, "It's an International Diesel Crawler!"

Equipped with a bulldozer blade, it's your best bet for digging basements and other excavations.

With an International Diesel, whole blocks of basements can be dug in one operation—and economically. Then the same crawler can be used to spread the spoil and fill in between foundations or to push it over ramps into trucks for removal. And it can finish the job by building streets and landscaping the whole area.

No wonder many contractors who specialize in basement digging prefer the International Diesel Crawler.

Greatly favored for this work is the International TD-14 because its size is within limits which permit ready transportation on the streets and highways of most municipalities and states. Yet it is a powerful, fast working crawler, fit for your toughest assignments.

Ask the International Industrial Power Distributor near you to supply specifications and complete information about this and other International Crawlers, Wheel Tractors, Power Units and matched equipment.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue **Chicago 1, Illinois**

INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

Remember this:

A TRUCK THAT FITS THE JOB LASTS LONGER

IT STANDS to reason that a truck will last longer—and will operate more economically—when it's powered with an engine "sized" for the job.

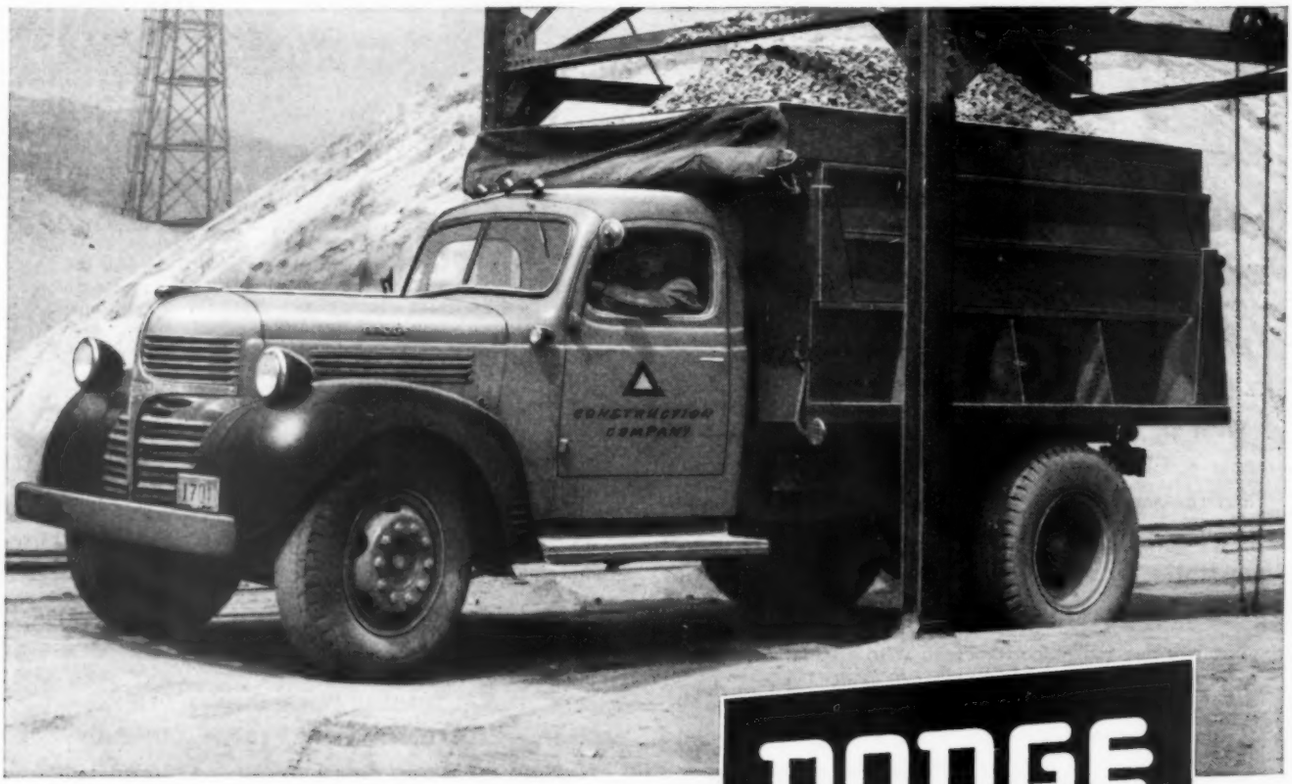
When you buy a Dodge "*Job-Rated*" truck, for instance, you get not one of two or three engines—but the right one of 7 different engines—the one "*Job-Rated*" to handle your jobs most efficiently and economically.

You get the right unit in every other part of the truck, too—the right one of 5 clutches, of 4 transmissions, of 18 rear axles—the right brakes.

Dodge can give you a truck that will fit your job—because Dodge builds a range of 175 different "*Job-Rated*" chassis models.

So if you want a truck "*Job-Rated*" for longer life, greater economy, and maximum dependability—hauling *your* loads over *your* roads—see your Dodge dealer for a truck to fit your job. And remember . . . *only* Dodge builds "*Job-Rated*" trucks!

DODGE DIVISION OF CHRYSLER CORPORATION



ONLY DODGE BUILDS "*Job-Rated*" TRUCKS

Fit the Job . . . Last Longer !

HIGH Concrete Pouring in TIGHT SPOTS

with the MULTIFOOTE Elevating Boom PAVER!

MultiFoote 34-E reaching over footings to pour footing caps on a new building foundation. Travel in tight spots and putting concrete where it's needed in big volume is a MultiFoote Elevating Boom Paver specialty.

Pouring full loads up to 18½ feet above ground level . . . maneuvering in tight spots . . . operating fast and easily on jobs *impossible* for most concrete pavers is routine for MultiFoote Elevating Boom Pavers. This is a concrete paver that can do a real job on all types of concrete construction work, as well as on straightaway paving . . . A machine that is big enough for the big jobs; and so economical in operation that small jobs are profitable, too.

The MultiFoote Elevating Boom is built for continuous operation on high pouring. Oversize clutches and brakes and special hoist transmission make this unit as dependable in use as the rest of the simple rugged MultiFoote Paver features.

Get full details from your MultiFoote Dealer—or write direct. Remember: *MultiFoote Elevating Boom Pavers are the only pavers built for continuous high pouring service.*

THE FOOTE COMPANY, INC.
1936 State Street
Nunda, New York

MULTIFOOTE CONCRETE PAVERS

See Page 10.

QUESTION:

What does a Walter Snow Fighter do when there's no snow?

ANSWER:

It hauls for road building; scrapes roads; works on construction jobs, floods, emergencies, etc.

THERE'S no "off-season" for Walter Snow Fighters. When winter is over, they earn their keep on countless maintenance, repair and construction jobs. Take off the plows and you have the most powerful, 100%-traction trucks for heavy hauling and difficult running conditions—on and off the road.

Remember—your Walter Snow Fighters have the exclusive Four-Point Positive Drive, with three automatic locking differentials—the "mechanical brain" that proportions power to each of the four driving wheels according to its traction at any instant. This provides unfailing traction in snow, ice, soft dirt, mud, steep grades —prevents wheel spinning and bogging down.

Your investment in Walter Snow Fighters gives you the fastest, most efficient snow clearing equipment, plus a bonus in year-'round usefulness. See your distributor—or write us for detailed literature.

WALTER MOTOR TRUCK CO. 1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

WALTER SNOW FIGHTERS

We were behind the 8-ball until...

We were going crazy on this big housing project. An old building had been razed, and it was our job to get the debris out of there but *fast!* Hard as we worked, we just couldn't seem to stay on schedule.

I'd probably be a gibbering idiot if our Oliver "Cletrac" dealer hadn't happened to drive out. "Why not put a Sargent OVERHEAD on that Cletrac of yours?" he grinned. "Then you can back up to that mess, get a load, and pull straight up to your truck, without turning, and dump the load. You'll save enough time to catch up to schedule. I've got an OVERHEAD in my place now. Send in your tractor, and my boys will mount it tonight."

Well to cut the story short, that's just what I did, and we not only caught up to schedule, we beat it! That quick service certainly got us out from behind the eight-ball. The Oliver "Cletrac" dealer is a good guy to know.

Cletrac

a product of

The OLIVER Corporation

OLIVER
Cletrac
SALES
SERVICE

"THE SIGN OF EXTRA SERVICE"

There's always a CP Tool exactly suited to the job

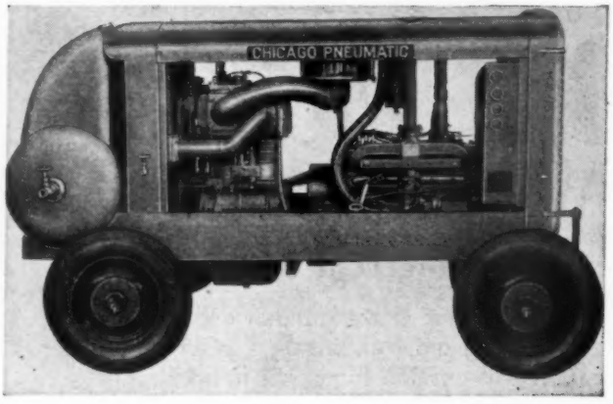
A Leader in its Weight Class

The 56-pound CP-42 Sinker Drill is ideal for general excavation, road work, shaft sinking, and quarrying, because of its penetrating power, fast drilling speed, strong rotation and good hole cleaning qualities. Its low air consumption makes it especially desirable for use with portable air compressors. CP Sinker Drills range from the 28-pound CP-22 to the 119-pound CP-60N.

Three Models of CP Backfill Tampers

CP has a pneumatic Backfill Tamper exactly suited to any particular job. CP-3 for medium heavy jobs; CP-MM for all general heavy backfill tamping; CP-4 for extra heavy work, as in earth dams. In trench work, especially, CP Backfill Tampers soon earn their cost by saving the time and labor of handling surplus excavated material.

For whatever type of work a contractor needs pneumatic tools, he will find CP equipment designed to handle the specific job most efficiently and economically. Besides the four typical CP products illustrated, other CP tools in wide use in contracting work include wagon drills, demolition tools, clay diggers, sheeting drivers, concrete vibrators, sump pumps and sludge pumps. Write for Catalog 600.



Ample Air — with Fuel Economy

In this portable compressor the gradual speed regulator and other CP features effect fuel savings of 15% to 35%. Varying the speed in proportion to air demand also reduces maintenance. CP gasoline-driven compressors range from 60 to 315 c.f.m.; Diesel-driven, from 105 to 500 c.f.m.

Popular CP Impact Wrench

With the CP 365-RP Impact Wrench, nuts and bolts, up to 1¼" bolt size, are applied or removed in a fraction of the time required by hand wrenches. Available either with side handle or pistol grip. One of a complete line of six models.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

The Embarrassment of Success

EVERY now and then a manufacturer succeeds in making a product so outstanding that public demand for it overwhelms production facilities. In his zeal for winning friends he finds himself making enemies — people eager to buy who cannot be assured immediate or even early delivery.

Thus, the earnestness the manufacturer has given to years of research and development — of product improvement and still better product performance—of efficient manufacture and unusual customer service . . . seems to come back to haunt him.

It is the embarrassment of success.

In becoming the world's leading manufacturer of Diesel engines, track-type tractors and motor graders, "Caterpillar" found many buyers forming a waiting line during the years when all products went into war use. To that waiting line were added many more whose favor was won by the illustrious war performance of these machines.

Thus, despite the fact that "Caterpillar" production is at a high point, demand is still outrunning supply. To catch up—and also to provide an extra margin of facilities for future needs — production is being increased as rapidly as possible by an expansion program that is adding *50 per cent more plant.*

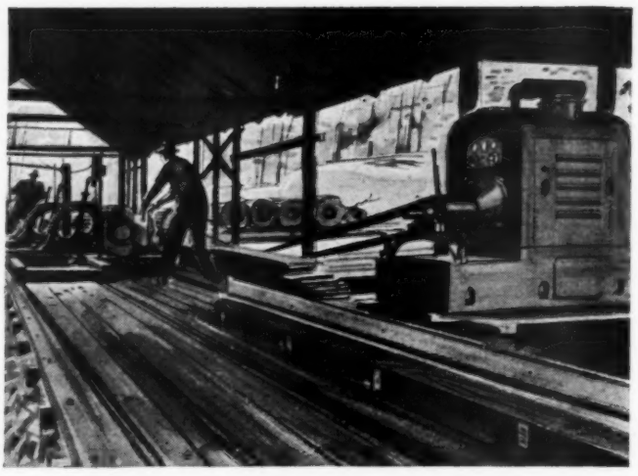
"Caterpillar" is deeply conscious of the problems of the many users who prefer and patiently wait for "Caterpillar" products. "Caterpillar" thanks every customer for such patience in awaiting his turn on deliveries. You can be sure that "Caterpillar" effort is the human utmost. It is live, resourceful — determined that, even in the face of material shortages and disturbed economic conditions, there shall be no unnecessary delays.

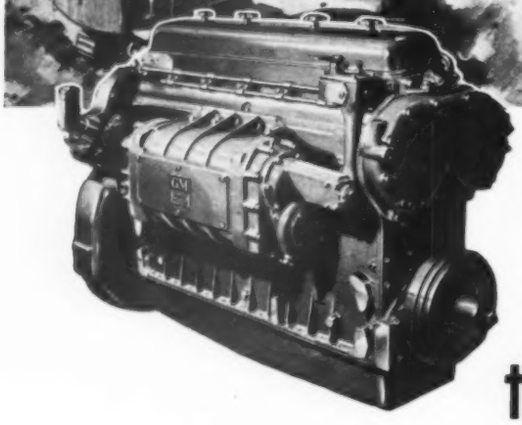
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR Diesel

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT





Takes any job in its stride

because—

there's power at every downstroke

IN many industries, the best power plant is one that picks up its load fast.

And among the first things that stand out about a General Motors Diesel engine is the way it takes up its load without any apparent slowing down.

The explanation is easy—there's power at every downstroke. No piston loafs through a single revolution as they do in most engines. So a "three" performs like a "six," a "six" like a "twelve"—smooth and powerful.

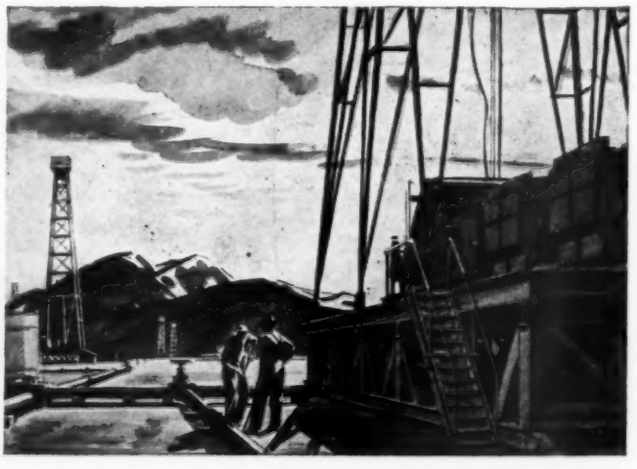
What's more, this means that the same power can be packed in an engine that's more compact and lighter in weight, that the engine starts easily, that it's clean, that it has fewer parts and is easier to maintain.

This makes the GM Diesel an outstanding power plant for any job you have. So if you are interested in low-cost, reliable, flexible power, be sure to get all the details about it.

DIESEL BRAWN WITHOUT THE BULK

GM
GENERAL MOTORS
DIESEL POWER

DETROIT DIESEL ENGINE DIVISION
DETROIT 23, MICH. • { SINGLE ENGINES . . Up to 200 H.P. / MULTIPLE UNITS . . Up to 800 H.P.
GENERAL MOTORS



You Should Know Better...

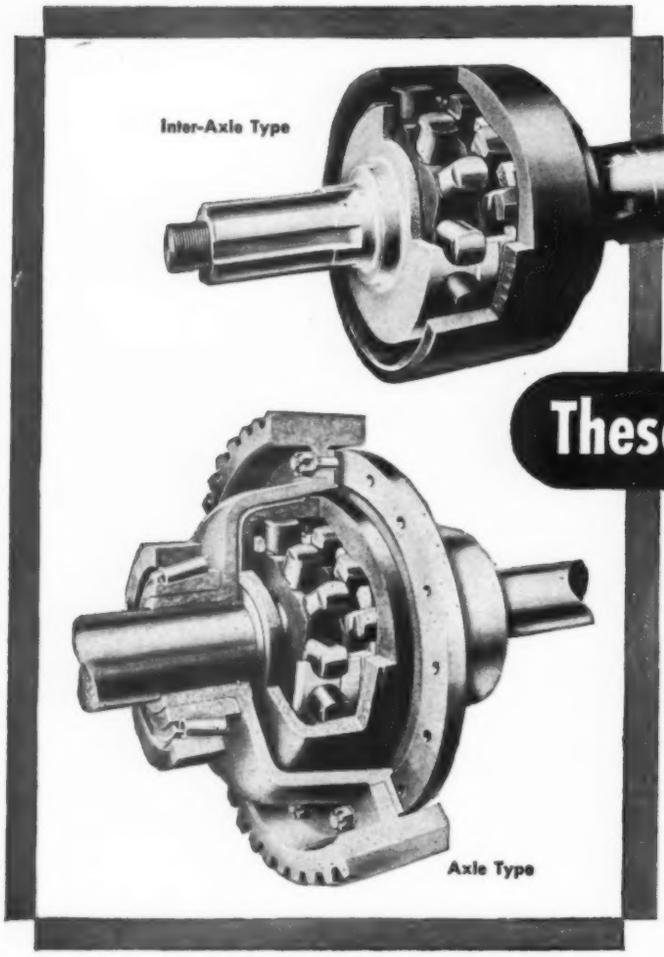
Owners . . . . operators . . . . yes, and even casual observers of Huber 3-Wheel Road Rollers in action, never question their performance. They know that throughout the years Huber has jealously preserved a reputation for dependable operation, low maintenance, all-around economy, plus the extra speed, power, and stamina to lick the worst in road jobs. Your best bet is to buy a HUBER.

THE HUBER MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER

3 Wheel • Tandem

ROAD ROLLERS *and* MAINTAINERS



These lick tough terrain...

These are the two types of the Mack Power Divider...another exclusive Mack development...the best way yet devised for preserving traction on slippery ground.

Positive traction with true differential action is assured by the Mack Power Divider. It contains no gears. It exerts no end-thrust. It is designed to transmit more torque to wheels maintaining traction...less torque to slipping wheels.

Serving as a third differential, the Inter-Axle type is used in all Mack four-wheel drive bogies for six-wheelers. It is a means of dividing power between the driving axles. This allows speed differences between the axles and makes up for unevenness in road or tires.

In either four- or six-wheel Macks for off-highway service, the Axle-type replaces the conventional differential, with which it is interchangeable.

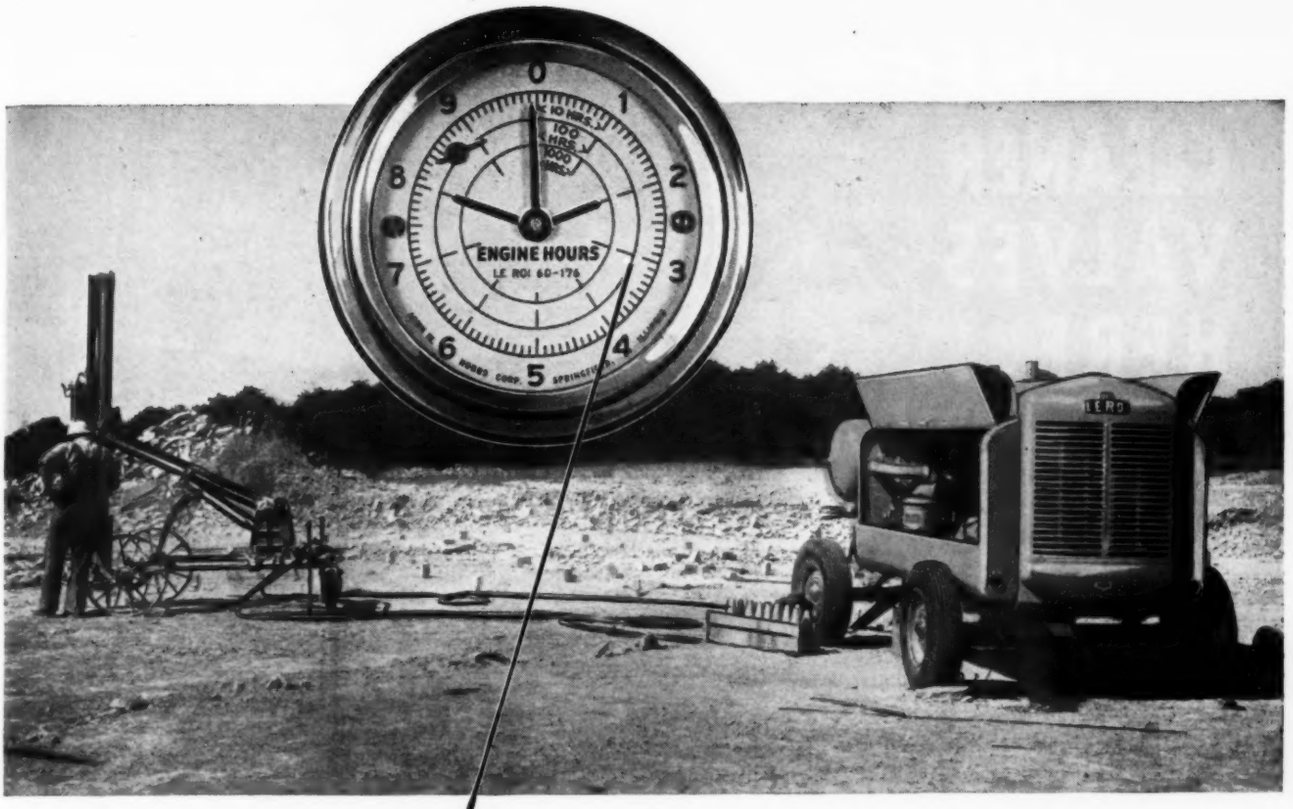
The Power Divider is another example of how Mack designs and builds trucks down to basic working parts to meet specific job demands.

Trucks for every purpose

Mack since 1900, America's hardest-working truck

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada Ltd.

THIS BIG, fast and powerful new Mack model LR 15-ton dumper, is one of several in the service of **Marquette Cement Manufacturing Co., Cape Girardeau, Missouri.**



be a clock watcher

. . . see why LE ROI AIRMASTERS save time and money

We are proud of AIRMASTER performance. We know what these compressors can do. We want you to know, too. That is why every AIRMASTER has an accurate electric hour-meter.

With this clock, you can easily check the hours of operation against fuel consumption and maintenance costs. You can quickly see the "money-in-your-pocket" benefits produced by the following features that have been so expertly teamed together by Le Roi engineers:

The fuel-saving regulation of the Econotrol.
The efficiency of the cushioned, magnafluxed AIRMASTER valves.
The dry, oil-free air from the new AIRMASTER intercooler.
The life-prolonging, positive lubrication system.
Unit construction — and many other refinements.

Besides showing that AIRMASTERS turn out air at lower cost, the clock keeps track of compressor operating time. This proves dependability, for you find that AIRMASTERS run longer with less trouble.

AIRMASTERS are available in all styles of mountings, and with gasoline or diesel power. Sizes range from 60 to 500 cfm. See your Le Roi distributor for all the facts or write for bulletins. Remember — AIRMASTER* stands for Portable Air Power at is Best.

*Reg. U. S. Pat. Off.

Le Roi
Heavy-duty engine

Le Roi
*105 Tractair**

Le Roi
Engine-generator set

Le Roi-
Centaur Mower

LE ROI COMPANY
MILWAUKEE 4, WISCONSIN
New York • Washington • Birmingham • Tulsa • San Francisco

LE ROI MILWAUKEE

C-109

ASSURE CLEANER VALVES HERE...

GET LONGER DRILL LIFE!

Prolong the life of your drills — assure fewer repairs and replacements — by lubricating them with Texaco Rock Drill Lubricants (E.P.). These famous, extreme-pressure lubricants prevent rust, resist wash-out, effectively protect all moving parts against wear even in the heaviest service. All conform to the lubrication specifications set by leading rock drill manufacturers.

LUBRICATE your compressors with *Texaco Alcaid, Algol or Ursa Oil* and valves will stay *clean* . . . assuring more efficient and economical compressor operation with full air pressure at your drills hour after hour.

Texaco Alcaid, Algol and Ursa Oils are free of impurities that lead to formation of hard carbon deposits. They keep rings free, valve action smooth and lively, ports and air lines clear. They provide Effective Lubrication for all your compressors — whatever their type or size.

For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

Helping a small city

BURST ITS SEAMS

How an Oregon suburban arterial highway was reconstructed to aid growth of a fringe developed community

By Ray Webber
Assistant Construction Engineer,
Oregon State Highway Department

THE relief of traffic congestion through a fringe development area is exemplified in a contract awarded by the Oregon state highway commission. This project borders the easterly corporate city limits of Klamath Falls, Oregon, in the south-central section of the state. It comprises approximately 2 miles of ribbon development which had been greatly accelerated during the war. The population of this new community is roughly 12,000 people. Most of the people who live in this area work in Klamath Falls and drive cars to and from their work. To this group is added 30,000 people who reside in the fertile valley beyond. The resulting traffic amounts to 16,000 cars and trucks per 24-hour period. In all, a critical period of traffic develops in the morning and evening which amounts to 4,000 cars per hour during the rush period. The original 20-ft. pavement was insufficient to handle this type of traffic.

Adjustment of Buildings

Engineering details were worked out to provide a minimum of alteration to existing buildings. Rights-of-way were purchased to the newly desired line, and buildings were then adjusted to the new line by altering the building fronts where necessary, this being accomplished as a part of

★ Sixth Street, Klamath Falls—reconstructed during 1946 from a 2-lane road to correct ribbon development evils and aid outlying community expansion. Note 31-ft. service road in right foreground, which was privately constructed by abutting property owners

★ At work clearing old paving, which was done under traffic to accommodate local retail business

the right-of-way agreement. Grade lines were laid on a profile of the elevations of the service entrances. With the profile as a base, street grades were varied to a maximum permitted under standards used by the Department. If this was insufficient to meet most entrances, adjustment was made by varying the curb height between 6 in. and 8 in. In a very few instances it was necessary to provide a step from the sidewalk into the building.

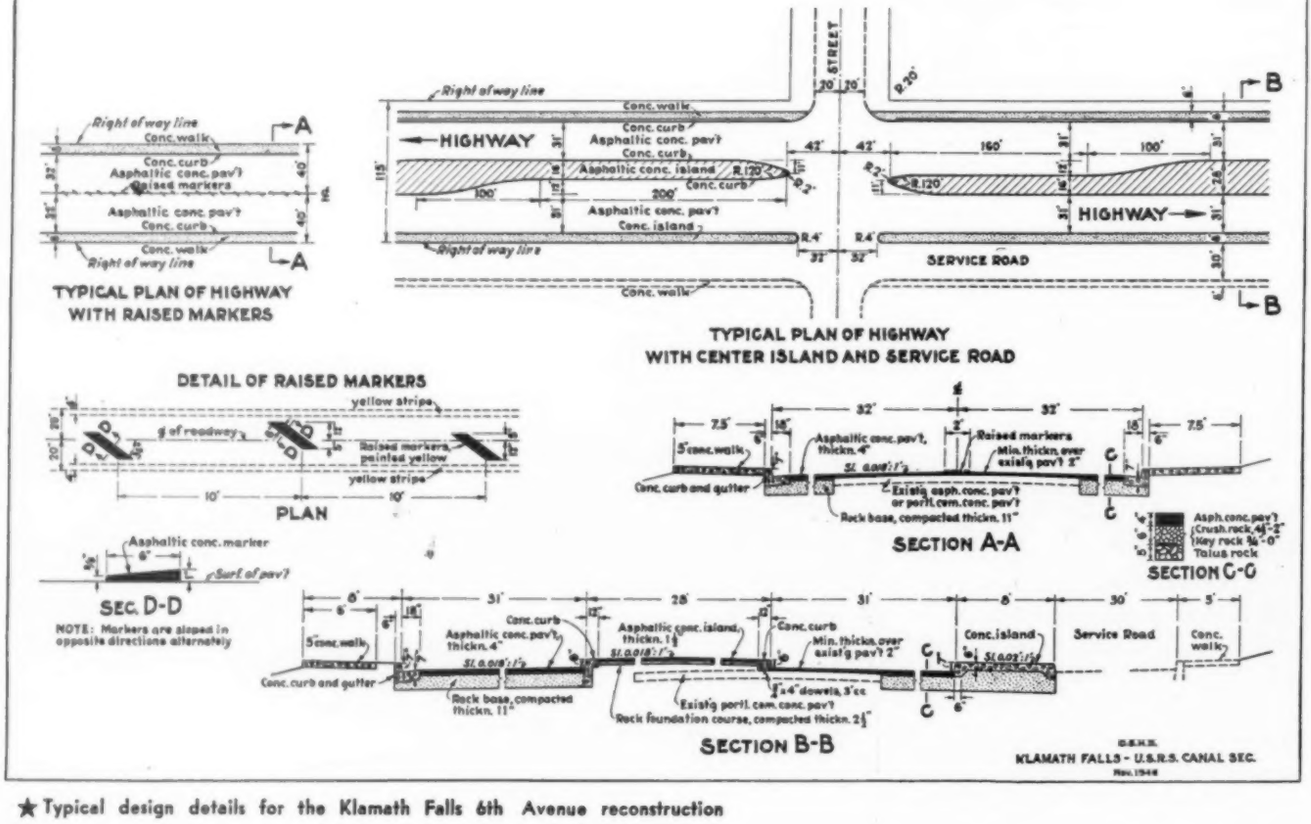
Dividing Traffic

The design included a 31-ft. travelway for each direction of traffic and 7½-ft. sidewalks on each side. These lanes are separated at critical traffic points by islands of varying width, permitting through travel to continue while local traffic makes left-hand turns. Deceleration lanes were designed for a highway speed of 40 mph. and were increased in length above the minimum required where it is expected that vehicles may have to stop frequently at the end of the lane before being able to proceed through the intersection.

At other places separation is maintained by constructing raised pavement markers of asphaltic concrete composed of ¼-in. minus mix with 5% to 8% of 61-70 pen. asphalt. These markers, 6 in. wide by 2'5" long, are set on centerline at a skew of 36°. They are sloped across the 6-in. width (when measured from the surface of the pavement) from ⅜ in. to 1 in. Spacing is 10 ft. on centerline. Prior to placing markers on the surface of the pavement, a light coating of hot asphalt is applied. Forms are used to construct these markers on the pavement.

Design Features

Plans required a subbase of 5 in. of compacted talus rock, over which was placed 6 in. of keyed rock base. The base was composed of 4½"-2" crushed rock, over which was placed ¾"-0" crushed rock in sufficient quantity to key the entire mass. Following construction of the keyed base, a binder course was used to form a smooth floor for the asphaltic concrete. This binder course included an application of RC-3 asphalt applied at a rate of between 0.25 and 0.35 gal. per sq. yd. Immediately after the spread of asphalt, ½"-0" crushed rock was applied at a rate between 0.006 and 0.008 c. y. per sq. yd. This top layer of crushed rock was then bladed and thoroughly compacted and allowed to set 3 days before the asphaltic concrete was placed on it. The 4-in. asphaltic concrete was placed in 2 courses, the top 1½-in. wearing surface containing between 5.5% and 7.5% asphalt and the bottom leveling course of 2½ in. contain-


TYPICAL PLAN OF HIGHWAY WITH RAISED MARKERS
TYPICAL PLAN OF HIGHWAY WITH CENTER ISLAND AND SERVICE ROAD
DETAIL OF RAISED MARKERS
PLAN
SEC. D-D
NOTE: Markers are sloped in opposite directions alternately
SECTION A-A
SECTION C-C
SECTION B-B
KLAMATH FALLS - U.S.R.S. CANAL SEC.

★ Typical design details for the Klamath Falls 6th Avenue reconstruction

★ Trenching for parallel sewers, needed to handle increased surface run-off collected by the expanded pavement area

ing between 5% and 6% of asphalt. Crushed rock for both courses of asphaltic concrete was ¾"-0" and the asphalt was 61-70 pen. All mixes were controlled by the engineer in the field.

Ready-mix p.c. concrete was used in the construction of the monolithic curb and gutters and walks and driveways. Due to the fact that this territory has a severe season of freeze and thaw, air-entrained concrete was used. The air-entraining agent was added to the transit-mixer at the batching plant at a rate of about 0.6 oz. per sack of cement. This resulted in air contents in the concrete on the minimum side of the permissible 3% to 6% ratio.

Service Road Constructed by Owners

Of considerable importance was the cooperation of the community in the planning and construction of this project. On that part of the project where future development is expected, the abutting owners have constructed at their own expense a parallel service road for the use of patrons of the business establishments to be constructed. This service road is 31 ft. wide and is entirely on privately-owned property. Provision is also made for sidewalks beyond the 31-ft. service road.

The businessmen feel that by providing a service road, patrons will have the advantage of unrestricted parking while doing business. A minimum restriction to travel on the highway will result, all service to the various business establishments being accomplished from the service road. Also, there will be no desire for patrons to double-park on the highway.

The service road was built by the contractor to which the public highway contract was awarded, agreement for the construction being made by the abutting property owners. Approximately 2,800 lin. ft. of 31-ft. road was constructed at a total cost to owners of about $35,000.

The normal flow of drainage was across the highway, but since originally only the pavement area was surfaced, most of the water entered the ground and did not cross the highway in appreciable amounts. With the surface of the new improvement covered with pavement, provision had to be made to take care of the concentrated water. In general, it was necessary to install 18-in. storm drains on each side of the highway, together with catch basins and manholes at intervals of at least one to each block. Provision was made to intercept the side drainage by extending drain tile into the existing side streets to permit drainage across the newly improved highway. The cost of drainage on this project was approximately 10% of the total amount of the contract.

Cost $194,000 per Mile

The contract for this improvement was awarded to Warren Northwest, Inc., on April 17, 1946, at a total bid price of $361,811 for the 1.86 miles involved.

This is a federal aid project designed and supervised by the Oregon State Highway Commission. R. H. Baldock is state highway engineer; H. G. Smith is construction engineer; W. E. Chandler is division engineer; and P. P. Whitmore is resident construction engineer. The contractor's men are Harry Hamilton, sub-contractor on concrete and drainage; and R. E. Batie, superintendent for Warren Northwest, Inc.

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To Prevent Diversion of Highway User Taxes

Resolutions proposing Constitutional Amendments to require that highway user tax revenues shall be used only for highway purposes have been introduced in nine state legislatures thus far. The states in which such resolutions are before the legislatures are Arkansas, Connecticut, Delaware, Indiana, Massachusetts, New Mexico, Rhode Island, Tennessee and Utah. In three of these states, Indiana, Massachusetts and Tennessee, the proposed anti-diversion amendments were passed by the 1945 legislatures and if again passed in 1947 will be submitted to the voters. The Tennessee amendment passed the Senate with only one dissenting vote.

★ Looking cityward on 6th Avenue. Typical left-turn decelerating lanes are shown in this photo and on p. 65

★ North end of main bridge and earth-filled approach. Widening completed for the earth-fill section. Steel barricade shown re-erected in new widened position, ready for pavement widening. Heavy traffic over bridge required substantial safety measures to protect workmen

Widening and Stiffening a Suspension Bridge

New York City's Bronx-Whitestone Bridge given repairs to handle increased traffic. Pedestrian walkways removed to provide 2 additional traffic lanes

By H. K. Glidden
Contributing Editor

WHEN the volume of post-war traffic between New York City and points north and northeast began early in 1945 to break 1941 records, the situation received the prompt attention of the Triborough Bridge Authority. This agency's Bronx-Whitestone Bridge provides the only direct route from Long Island to the Hutchison River and Merritt Parkways, which serve Westchester County and New England. Long Island residents, including those in Brooklyn and Queens, use this bridge whenever possible to save mileage and avoid the congestion of New York's uptown traffic. It was a natural, therefore, to consider increasing the capacity of this bridge as much as possible.

Completed in April, 1939, the bridge was a boon to many World's Fair visitors. It provided two 27½-ft. roadways, separated by a raised barrier. While 27½ ft. proved ample for two lanes of traffic, it was not intended to be wide enough for 3 lanes of modern mixed-traffic.

Walks Found Unnecessary

The original construction included a walkway on each side of the bridge. Steel barricades provided pedestrians with protection from vehicular traffic. Since the bridge is in a suburban section and not at all close to large centers of population, the walkways were seldom used. In addition to not being particularly useful, the walkways proved to be a problem since the authority had to guard against mischievious youngsters dropping sundry objects on boats using the East River 135 ft. below.

As traffic increased, the bottlenecking effect of the bridge became more apparent since its excellent approach highways could easily accommodate 3 lanes of traffic in each direction. It was logical that the walkways should come in for close scrutiny in the process of trying to find means of increasing the bridge capacity to that of the approach. The accompanying cross section of the bridge floor shows how each of the roadways was widened to 30 ft. 9½ in. by eliminating the walkways and extending the roadway to include all available space on the bridge.

Widening Details

The widening was accomplished by moving the sidewalk barricades out as far as possible. As is shown in one of the accompanying photographs, the pilaster effect of the towers prevented the full width between the existing girders from being utilized for roadway. The space between the

★ Partially-completed stiffening truss. Steel erection was stopped by a local truck strike leaving gap shown in center and sections on either side of towers, to be filled in when steel deliveries were resumed

original pavement and the re-erected barricade was paved with reinforced concrete. The space between the re-erected barricade and the existing girder is taken up by the stiffening girder and a grating which is expected to be useful in maintenance work. These details are shown in the photographs.

This new width has proved to be sufficient when trucks and slow moving traffic are kept in the outside lane and the faster moving passenger cars use the two inside lanes.

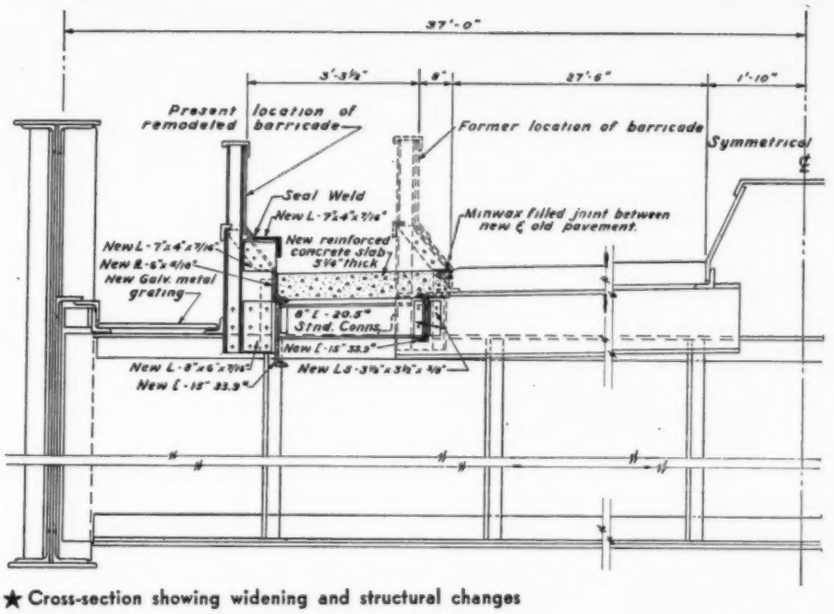
New Stiffening Truss

While the movement of the bridge floor has never approximated the design limit, a corollary effect of the widening was additional stiffening.

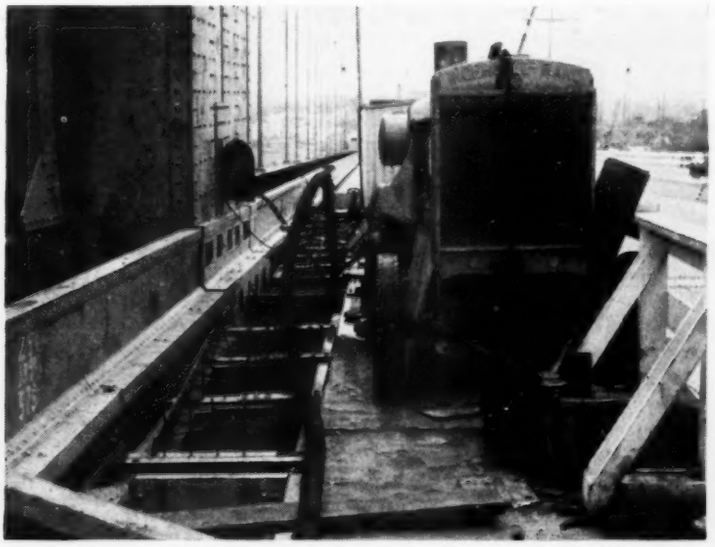
The stiffening was accomplished by means of a truss erected the full length of the main bridge. The truss, of course, was not required on the approach viaduct even though this section and the earth-fill approach section were both widened. The truss has an overall height of 25 ft. except where the low point in the main cable reduced this dimension to 11 ft. The truss was fabricated and installed so that it would become integral with the existing girder.

Madigan and Hyland, New York consulting engineers, were given the preparation of contract drawings and supervision of the construction. This project proved to be of exceptional

(*Continued on page* 71)



★ Cross-section showing widening and structural changes



★ (Left): Completed roadway widening, edged by re-erected barricade. A short section of original girder can be seen at right, between two upright members of new stiffening truss. Note grating installed between barricade and the original girder. (Right): Re-erected barricade is shown where it passes a tower. Pilaster effect of tower was the limiting factor which governed the extent of roadway widening

EDITORIAL

★ Equipment Servicing to Get More Attention

Among the various committee and group meetings at the recent AED convention, one of the most important was the session on servicing of equipment. Led by Harry J. Hush of Griffin Wellpoint, a small group of interested delegates recommended the formation of a new Association committee on service policies and how they can be improved for the benefit of machinery customers. This proposal was later adopted by AED.

From the manufacturer's side, it was claimed that distributors do not give enough service these days, but expect the factory to do everything from demonstrating to air mailing of rush parts. On the other hand, dealers now generally have good machine shops, and have usurped many of the functions formerly held by the manufacturer.

At any rate, contractors in the future are going to expect more and more service, and it was argued that the smart distributors will capitalize on this as a means of good will and sales. It was said that the average contractor would rather buy an inferior piece of equipment that he knew had good service backing than the best machine with poor servicing.

A national policy of distributor servicing in agreement with manufacturers will be sought. There are several serious questions at stake. For instance, what of the trend by certain large manufacturers to establish a dealer in every county, thus scattering his sales thin? Such dealers cannot afford a mechanic unless they have other lines to support him and occupy his chief attention.

One manufacturer's representative told of his factory's policy of sending home-office, mechanically trained men out to go around with dealers visiting their machines on the job. This kind of field contact helps the distributor spot owners who need mechanical work done, and gives manufacturers first-hand data on user problems and the way their machines are standing up and functioning. A few distributors have roving service cars of their own, out looking for machines at work that might be creating dissatisfaction because of mechanical troubles that can easily be corrected.

Another of the big needs to come up in this meeting was that of training operators. A case was related of an official in an operators' union, Local 150, in Indiana, who came to a distributor and asked for cooperation in putting on a school to help his members to better work in the field. The school was held early in 1946 at Indiana Harbor, the "students" meeting after work hours. Some 85 men attended the first night. Distributors had motors torn down, and used blackboard methods to stimulate discussion. Sandwiches and coffee were also part of the technique.

It was revealed that some of the operators are mechanical engineers, others factory trained mechanics, but that none had had a whack at such a practical type of training course. The point was made that it is nearly useless to try to teach a man while he is working; he's too preoccupied with his job.

Subsequently several other meetings were held, with upwards of a hundred in attendance, many men bringing their sons along. Contractors also sent their mechanics. A class was eventually held also in northeastern Indiana.

All in all, the experiment revealed to all concerned that this is a big field for education, that the men are hungry for more know-how, but that the school must be conducted right. No "sales talks." Competitive makes should be covered, as this distributor did with motors. Slides and movies are desirable.

The pay-off for the distributor was said to be good, in the form of definitely increased business through new friendly contacts with operators and superintendents.

The foregoing hardly needs editorial comment, but we will close with the point that more efficient equipment, more efficiently operated, is the final means to lower highway costs. Brother, we're all plenty interested.

★ New Ideas Challenge Oldsters

A few years ago if anyone had come to us and proposed to classify and map the character of soil and the drainage conditions of a location or region by air photography, we would have said he was off his nut. Today it looks as though such a technique has reached a stage of definite procedure, applicable most anywhere in the country.

We challenge the skeptic to go to Purdue University and get shown. Soils classified by air have been double-checked in Indiana by literally thousands of test borings. It certainly looks as though here is a really new technique, and one that will afford great savings in time, technical manpower and money on various phases of engineering work. Air photography today can be used to show what areas or locations to favor or avoid in airfield site selection, for example. Ditto for new road location. Ditto for spotting of gravel deposits. Ditto for location of important drainage lines and watershed divides, making possible speedier and surer decisions on culvert and small bridge run-off and waterway areas, and ditto for determining the soils a contractor is up against in bidding. There are other uses of this important new technique.

The air-photo idea is, of course, still somewhat tentative and experimental in many detailed respects. But enough know-how is available, with proof of value, for any engineering staff to apply it effectively—*if* they are willing to "try something new" and go to school a little. The idea is worth trying out on a wide front. Anyone interested ought to read the papers, "Development of Drainage Maps From Aerial Photographs," by Merle Parvis of Purdue University and the Indiana highway commission; "Application of Aerial-Strip Photography to Highway and Airport Engineering," by J. E. Hittle of the same school; and "New Glacial Features Identified by Air Photos in Mapping Program," by R. E. Frost and J. D. Mollard of Purdue. These papers, given at the recent annual meeting of the Highway Research Board, will be available during 1947 as part of the Board's proceedings.

★ Send County Engineers to School

One of the most valuable means of exchanging practical experience and bringing ourselves up to date on new ideas and methods is to hike off to a well conducted highway short course. As they are conducted annually under engineering college sponsorship in such states as Michigan, Texas, Indiana (Purdue) and a few others, these 2 or 3-day intensive affairs are of far-reaching benefit. Who knows but that one single meeting, in a state spending tens of millions of dollars annually for road construction and maintenance, will generate and spread ideas worth millions of dollars to motorists and taxpayers?

Yet in many states no such courses are ever given. Especially serious is the need for county engineers to get together more often. We understand that some counties and entire states have laws or rulings specifically disallowing traveling expenses for attending such meetings. One of the first purposes of organizations interested in furthering organized county and local road effort should be to get this situation changed.

County engineers have big local programs in their laps. No phase of the national highway task involves such a bewildering range of local conditions, or calls for such resourcefulness in applying modern practices to the utmost within limited budgets. The outstanding strength of the typical county highway engineer is his intimate knowledge of his local roads, mile by mile, and his ability to work out practical methods by hard experience. The collective experience and judgment buried in the roads of two thousand or more counties is a rich untapped lode.

★ It was Good Stuff

Technical committee leaders are to be congratulated for the excellent papers and discussions given at the recent Road Builders' convention. Good meaty stuff, the kind that is worth a long train ride to come and hear. Along with the Town Hall meeting on Airports with its panel of thirty or more, the technical talks served to give us a feeling that ARBA is on the beam. Now for the big 1948 tent show, with all the new models.

Some fellers come to the Road Convention to meet the boys, some come to get next to new equipment, others to get a technical brushing up. The latter is the quiet hard-working part of such meetings. A series of well thought-out papers such as we just heard in Chicago took months of committee work behind the scenes. Technical committee chairman H. F. Clemmer and the heads of individual committees too numerous to list here all deserve a good hand, not to mention our slave driver friend Macatee, who whipped the panel of airfield experts into a fast-moving affair.

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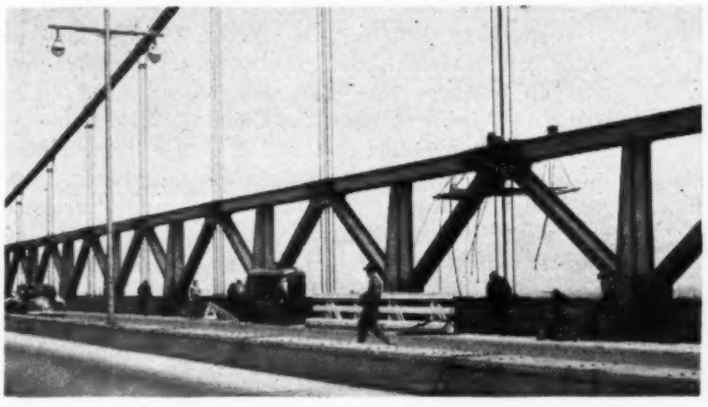
An all time record for collections of Federal automotive excise taxes was hung up during the calendar year 1946, according to figures released by the Bureau of Internal Revenue. The 1946 amount was $898,431,411, which marks a 5.9% increase over 1945 collections. The portion of these taxes paid by highway users is estimated by the National Highway Users Conference to total $806,184,481 or almost 90 cents on each dollar collected.

The grand total of Federal automotive excise tax collections, Conference studies show, since their inception in 1917 as a war revenue measure aggregates $8,214,489,386, of which it is estimated highway users have paid 90.6%, or $7,438,620,406.

(*Continued from page* 69)

interest to their chief engineer, E. L. Pavlo, who is a nationally recognized authority in the suspension bridge field. Madigan and Hyland were in charge of the original construction of the Bronx-Whitestone bridge and designed the changes involved in the widening. O. H. Amman and Shortridge Hardesty acted as consultants on the design of the widening alteration. Mr. Amman was also responsible for the original design of the Bridge.

The Woodcrest Construction Co. of New York City was awarded the contract in November, 1945, for $1,300,000, which included widening, stiffening and painting. The Pittsburgh-Des Moines Steel Company had the subcontract for the fabrication of steel, and the Fiether Steel Corporation of New York City was the erector. The contractors were confronted with many possible hindrances to progress from the steel strike, the coal strike and the City's paralyzing truck strike. In spite of these difficulties the work was completed (with the exception of painting) in December, 1946.



★ Stiffening truss in place on center span. (Right): Final riveting in progress. Note details of widened pavement, relocated barricade and stiffening truss

Special Editorial

★ Awakening Giant — Overseas War Surplus

AS this is written shiploads of American construction machinery have begun to arrive back on our shores. It is coming from Guam, the Philippines and elsewhere. Some is army stuff declared surplus, some originally supplied to foreign governments through wartime credit channels—virtually a gift from American taxpayers.

The point of immediate concern with us all is that much of this machinery was grabbed up by speculators and will be dumped on the domestic market, to the serious harm of road machinery manufacturers and distributors and with doubtful benefit to our construction program.

This isn't a penny ante business. Hundreds of millions are involved in construction stores alone. Uncounted billions in all kinds of war supplies are piled all over Europe and goodness knows where. This surplus is indeed an Awakening Giant—a critter that can mess up segments of our national economy under its floundering footprints if it ever goes on a rampage.

That January 18 Order

To review recent events, a Foreign Liquidations Commission order appeared January 18, signed by secretary of state Byrnes. This order actually originated through OWMR, with the Civilian Production Administration as the fact finding agency. It was an innocuous looking one, buried in a routine government report. Sprung apparently without the knowledge of other interested government branches, it quoted the president as authorizing the return home of certain military supplies abroad which had been declared surplus in recent months. The order was executed on the grounds that certain items of machinery were in short supply and urgently needed in the United States.

The order also appeared to sanction the purchase, by American buyers, of construction equipment previously donated or sold by our government to a foreign government.

Thus was precipitously launched a broad policy of overseas disposal, predicated on an obscure word "feasible" in our Surplus Property Act. Attached to this retroactive order was a list of 79 categories of returnable items including many types of road and construction machinery. In effect this order freed virtually all construction machinery for re-importation.

Amended Order Issued

The January 18 order quickly brought results. Speculators and moneyed interests who had their ears cocked moved fast. One speculator is said to have had boats ready at overseas docks, and was in New York peddling several millions of the stuff before the order was hardly cold. Three boatloads have already arrived at Baltimore from army surplus at Guam.

Fortunately for U. S. citizens in general, others also acted promptly. It did not take long for construction and equipment leaders to get a hearing and show with detailed figures that the equipment shortage at home is no longer universal. The shortage today actually is spotty and fast fading. Scrapers and bulldozer aprons, for example, are available for immediate delivery almost everywhere. Certain of our machinery manufacturers are well up on deliveries on their entire lines and have high inventories. Makers of a few types of units, such as crawler tractors, power shovels and motor graders, continue to be behind with their deliveries, but the shortage of such items is regarded as quite temporary, some forecasters think. We'll possibly see a good old-fashioned buyer's market clear across the boards before many months, with all the business competition anyone can ask for.

When these facts became evident, the January 18 order was reviewed, the gravity of the possible impact on business was seen, and an amended order issued. An order through the Office of War Mobilization and Reconversion removed 38 of the 79 categories including most lines of construction machinery, leaving only tractors (with one attachment), crawler cranes and motorized graders approved to enter the country. All automotive categories were removed. The new order ruled that only such stores as were purchased from the overseas stores before February 27 could enter, and that these goods must be on the water

within 90 days. An October 1 time limit was placed on even the three categories still allowed.

Let's Analyze a Bit

While possibly this new order rules out certain items currently needed, it makes good sense in general. It recognizes that the need for machinery is *now*—at the start of the construction season—rather than at some indefinite later date; that shortages are no longer industry-wide, but confined temporarily to specific items. Most important, it keeps the Giant under control for the moment, until more wisely considered plans can be developed.

At first blush the amended order may seem all wrong to equipment-hungry highway and street departments and contractors. We don't blame road officials for seeing only their side, in view of the long run-around they've received in the domestic surplus disposal bungle. We can't blame contractors, either, who are hollering for certain equipment so they can go through with commitments.

But the equipment shortage still existing is small potatoes compared to the bigger issues. Every thinking American is rightly alarmed at any possibility of opening the flood gates willy-nilly to the billions of war materials. To be sure, we are on the threshold of the biggest road building year in history. But filling a few equipment shortages isn't the biggest worry in getting our program rolling. The engineer shortage is more serious, and construction prices something else again. Contractors are bidding high largely because of many unbalanced or complicating factors, and won't come down in the face of new unbalances. A rash of new-born bargain equipped contractor competitors can't bring bids down under present conditions without wholesale bankruptcies.

Highway officials, engineers, contractors, all of us, must see beyond our little jobs to the whole canvas.

The construction industry is a foundation stone of our peacetime economy. Virtually all construction is finally carried out by private enterprise, and the tools of construction are manufactured, distributed and serviced by private enterprise. This is still the good old U.S.A. Millions of jobs are at stake. We cannot afford to destroy values on such a vast scale, or so seriously to disrupt our way of life, as would occur with uncontrolled dumping of overseas war material back into our home life. The worst feature of the recent buying activity is that big syndicates are involved, with no limitations on where they can sell. Whole shipments can be dumped on one community.

Several Recommendations

The following recommendations for consideration in revising the Surplus Property Act are much in line with those which a manufacturer leader presented at the recent Associated Equipment Distributors meeting in Chicago. We, as the editors and publishers of ROADS AND STREETS take this opportunity to join in hearty endorsement along with leaders among engineers, contractors and suppliers.

First, it is clear that the war surplus must be disposed of somehow. So, please, Washington, exercise the utmost vigilance to see that no further ill considered blundering orders are issued. Such moves kill our confidence in government. We have enough of a mess in the handling of the domestic war surplus. Even yet, the overseas surplus problem offers an opportunity of beginning virtually from scratch and performing a great public service.

Second, study avenues for disposal of overseas war surplus to foreign countries now clamoring for equipment. India, for example, is asking to buy industrial equipment including road building and construction items from American production lines. Supply India from China's excess. France, Holland, Sweden, Greece, Turkey and other countries are desperate for equipment and some have purchasing commissions here looking for machinery. Supply them from Germany. If we don't watch out, this stuff will be passing speculator-bought importation goods in mid-ocean.

Protect Business

Third, and most important, don't sell us out to speculators. If and when you in your wisdom decide to allow more machinery to re-enter the U. S. it should come in and be distributed through established business channels. In that way everyone will gain. Machinery houses won't be forced to the wall by artificially set up competition. Our contractor friends can hope to stay solvent and grow increasingly efficient. Machinery buyers then will not be dealing with fly-by-nighters who aren't equipped to guarantee and service their machines. Manufacturers won't suffer the double injury of having their distribution disrupted and seeing the buyer get rough deals on machines with their name plates.

In the event such resales take place, it should be considered that excess profits obtained from these transactions, by either the foreign government or the one who is profiting as an intermediary, by right belong to the American taxpayer who, in the first place, through his government, has donated this equipment from American-owned surpluses.

Fourth, Washington, please let industry advisors help. Don't be afraid they'll act too selfishly. Their record during the war, by and large, was one of serving the public interest. Industry advisors can legally be consulted and they are ready now to help on this big problem, so that every angle is explored.

Above all, know the facts. We need certain equipment now. But wrecking a segment of the construction industry is too high a price to pay for getting bargain machinery into the hands of a few users. Control the Awakening Giant.

—Harold J. McKeever.

Contractors at Work

Peter Kiewit Sons Company
Grading & Paving Contracts
US 99, Washington

★ I. W. Brunsback, asst. district manager for Peter Kiewit Sons Co., with resident engineer Harry Klein

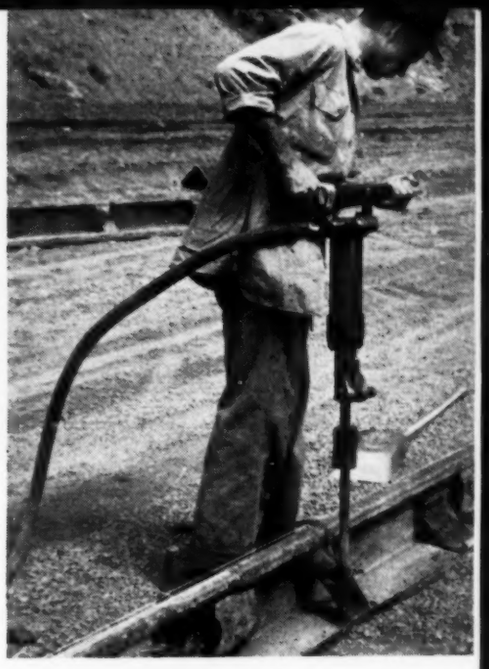
SECTION by section our overloaded, out-worn and out-moded arterials are starting to be reconstructed. One of the most important of such projects, pushed in the Pacific Northwest during 1946, was the relocation of 5.7 miles of US 99 (Washington state primary highway No. 1) from Woodland northward. Peter Kiewit Sons Co. was awarded the clearing, grubbing structure, grading and paving Oct. 9, 1945, and spent the 1946 season on the work, dovetailing this project with a similar 1.4-mile, $121,000 heavy grading job a few miles northward on the same highway. As noted in the accompanying bid breakdown, the 5.9 mile job entailed only 112,000 c.y. of excavation, while the 1.4 mile job went through some heavy cuts. The 260,000 c.y. contained much rock which was moved with scrapers by doing considerable drilling, shooting and rooting.

US 99, incidentally, is Washington's busiest highway, averaging 4,000 to 10,000 vehicles daily along the Portland-Tacoma-Seattle axis.

★ A 34-E dual-drum paver, paced the work on US 99, Washington, last summer. The slab was first paved half-width all the way through the project

The pictures shown here were snapped by the Editor of ROADS AND STREETS last July, at which time the longer project was being paved and the grading outfit had moved on the shorter project. Typical of Kiewit and other larger western contractors, the equipment outfit seen on these jobs was above average in newness and mechanical condition. The paving work, in particular, was buzzing with something like the good old pre-

★ Kiewit's home-made subgrade screed, built with heavy timbers and faced with a scraper blade, was designed to work forward or backward. Note long shoes riding the form to spread the heavy weight. Also the lever for raising or lowering the strike-off level



★ Steel forms—first ever to be used on a concrete road job in the Pacific Northwest—were pinned down with pneumatic jackhammers

war speed and steadiness.

The contractor had average breaks in weather and all in all was happy. However, the lack of experienced paving men and being held up now and then for cement caused considerable delays. Crossing and recrossing the old converging road was one obstacle.

This project was notable for being the first in the timber-conscious Northwest on which steel road forms were ever used. Also, for being the first resumption of concrete road paving in 5 years in Washington.

A few words about the engineering details. The relocation eliminated numerous minor kinks and grades. Built on a 100-ft. minimum right-of-way, the new pavement consists in the main of a 9-in. uniform concrete slab with variable depth of selected ballast, and a leveling course of ⅝-in. material spread full width. This blanket was usually made 5 or 6 in. deep under the slab, but on some sections was thickened to 7 in. or more, going as deep as 18 in. under exceptional conditions, based on engineering judgment. Some of the heavier fills were paved with asphalt pending settlement. Shoulders were given a 2-course crushed stone surface.

A soil profile aided soil analysis. Some cut material was deemed unsuitable for fills and was spoiled. The fill and the blanket were compacted in the usual 6-in. layers, although some projects in Washington have special compaction specifications. The state allowed sheepsfoot and 3-wheel flat roller here. Pneumatic rollers haven't always been specific since the war because not readily obtainable by the contractor.

The concrete pavement was provided with expansion joints at 300-ft. intervals. Mastic filler was specified in place of the desired cedar filler, due to unavailability of the latter. Expansion joints have the usual doweling; except that dowels are located near the top of the slab. The longitudinal center joint is tied but not keyed.

Safety features in the roadway design include channelizing at all highway intersections where 200 or more vehicles cross daily. No provision was made for limiting access, however, as adequate laws for this purpose are still lacking in Washington.

★

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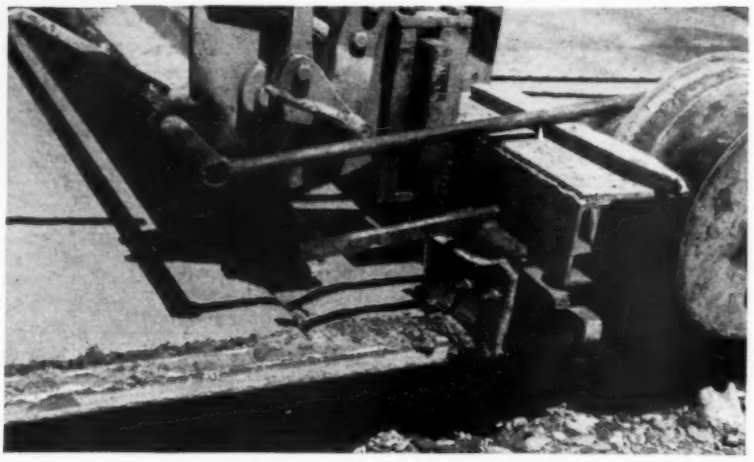
(See next page for more pictures)

★ A traveling float-type finisher was used. Shown here being towed by a tractor across an intersection. This chore held up the paver for an hour or so —but was speeded by use of rubber tires on the rear end of the finisher

★ Five-batch trucks were employed, batches being 8½ sack

★ Strike-off equipment included a horizontal liftable vibrator bar

★ Close-up of oscillating type finishing machine. Note piece of old tire bolted in position to sweep waste material off the forms



★ Kiewit's bulk cement plant, located at a convenient siding along the job

★ Creek water for the sprinkler trucks comes out here—a very convenient arrangement

★ Both 12 and 24 yd. scrapers worked the big juicy cuts, aided with liberal use of the rooter

★ This car unloader worked fine. An electrically operated winch drew a hand-maneuvered cement scoop toward the car door, dumping into the hopper as shown

★ This traveling house was Kiewit's answer to the problem of a mobile tool and supply unit

Bid Details, Grading and Paving of 5.9 Miles US 99, Washington

Project located near Woodland, Wash., as noted in accompanying article. Carried over through 1946. Bidders:

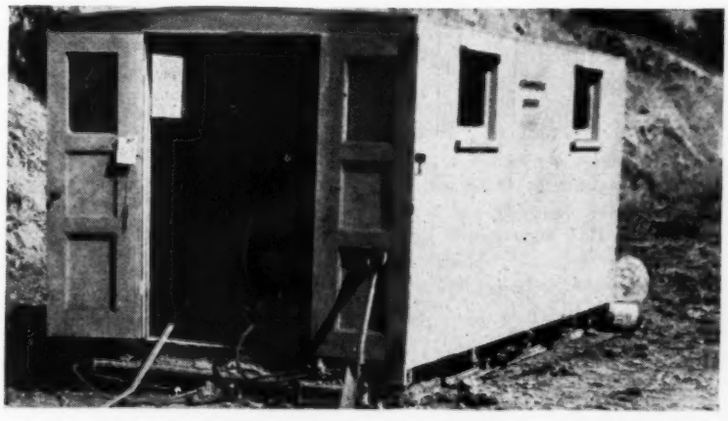
(1) Peter Kiewit Sons Co., Seattle and Omaha (*Award*) $476,363.98
(2) E. W. Elliott, Seattle..... 480,125.23
(3) Porier W. Yett, Portland..... 518,367.34
(4) N. Fiorito Co., Seattle..... 521,958.82
(5) Erickson aving Co., Seattle..... 541,677.50
(6) Fiorito Bros., Seattle..... 544,252.44
(7) Warren Northwest, Inc., Portland... 648,239.62

Items and Quantities		(1)	(2)	(3)	(4)	(5)	(6)	(7)
9,080	cu. yd. common exc. incl. haul of 600'.....	$ .35	$ .41	$ .35	$ .35	$ .45	$ .35	$ .35
112,650	cu. yd. unclass. exc. incl. haul of 600'.....	.78	.77	1.00	.85	1.15	.75	1.20
130	cu. yd. common trench exc. incl. haul of 600'.....	2.50	1.90	3.00	2.50	2.00	2.50	4.00
10	cu. yd. solid rock tr. exc. incl. haul of 600'.....	10.00	7.50	5.00	5.00	5.00	10.00	15.00
21,591	cu. yd. stas. overhaul on above materials.....	.02	.025	.01	.02	.02	.02	.02
2,731.83	M cu. yd. stas. overhaul on above materials.....	4.50	4.50	6.00	5.00	6.00	5.50	12.50
150	cu. yd. structure excavation	4.00	6.00	2.50	2.50	3.50	2.50	5.00
3,900	lin. ft. slope treatment	.25	.11	.20	.15	.20	.25	.20
300.8	stas. (100') finishing roadway	12.00	14.50	15.00	20.00	20.00	15.00	10.00
50	cu. yd. gravel backfill in place.....	4.00	4.00	4.00	7.00	4.00	5.00	4.00
29,310	cu. yd. sel. rdwy. borrow in pl. on rdwy. incl. hl. ...	.97	1.90	1.50	1.65	1.75	1.75	2.25
6,600	cu. yd. cr. stone surf. top cr. in pl. on rdwy.	3.60	3.25	4.00	3.25	3.40	3.30	3.75
7,330	cu. yd. cr. stone surf. base cr. in pl. on rdwy.	3.40	3.25	4.00	3.25	3.40	3.30	3.75
185	M. gal. water.....	2.50	2.00	2.50	5.00	2.50	2.50	3.00
79,523	sq. yd. cem. conc. pav. std. 14 day mix 9" sec. in pl.	3.09	2.83	3.00	3.30	3.00	3.60	3.79
960	sq. yd. cem. conc. pav. high early str. 9" sec in pl.	3.95	3.22	3.10	3.75	3.20	3.85	4.10
2,500	only dowel bars with rubber caps in place.....	.25	.28	.25	.30	.25	.30	.30
1,540	lin. ft. refl. traffic curb type A in place.....	1.85	2.00	1.50	1.75	1.90	1.75	2.00
669	lin. ft. refl. traffic curb type C in place.....	2.40	3.00	1.50	2.20	2.35	2.25	2.75
3	only refl. curb nosing in place.....	15.00	20.00	100.00	15.00	11.00	15.00	35.00
425	tons type I-1 asph. conc. pav. cl. C wr. cr. in pl. ...	10.00	9.00	9.00	9.50	9.00	8.50	9.00
1,145	tons type I-1 asph. conc. pav. cl. E lev. cr. in pl. ...	10.00	9.00	8.00	10.50	9.00	8.50	9.00
1.25	cu. yd. concrete class C in place.....	60.00	80.00	50.00	75.00	50.00	50.00	100.00
7,400	lin. ft. std. beam gd. rail tp. No. 1 or 2, desg. 6 in pl.	1.50	1.50	1.50	1.65	2.00	2.00	1.60
56	only spot posts (treated) in place.....	6.00	7.00	5.00	4.00	4.00	2.50	5.00
136	only asph. conc. traffic buttons in place.....	1.65	4.00	2.00	4.00	3.50	3.50	3.00
6	only temp. bdg. across pav. (take down type) in pl...	210.00	200.00	150.00	75.00	135.00	75.00	300.00
2	only embankment protector (calco or equal) with type A spillwy. inlet, complete in place.....	25.00	150.00	250.00	30.00	10.00	25.00	40.00
6,592	sq. yd. remov. exist. conc. pavement.....	.40	.70	.35	.25	.50	.75	1.00
1,273	lin. ft. remov. exist. guard rail.....	.50	.25	.50	.40	.10	.25	.50
1	only remov. and reset. exist. conc. monument.....	120.00	25.00	50.00	25.00	10.00	25.00	100.00
60	lin. ft. pl. conc. or V.C. culv. pipe 12" D. in pl.	1.50	1.60	1.50	1.45	1.00	1.75	1.50
51	lin. ft. std. reinf. conc. culv. pipe 18" D. in pl.	3.25	2.70	2.75	3.60	1.75	3.25	3.50
132	lin. ft. std. reinf. conc. culv. pipe 24" D. in pl.	4.50	3.90	3.00	5.25	3.00	4.00	5.00
54	lin. ft. std. reinf. conc. culv. pipe 36" D. in pl.	10.00	8.10	10.00	10.00	10.00	10.00	15.00
96	lin. ft. bit. coated corrugated metal culv. pipe type No. 2, No. 16 gage 8" D. in pl.	1.75	1.50	2.00	1.10	2.00	2.25	1.75

★

Seen on Peter Kiewit & Sons Co. Grading Job near Kelso, Washington, summer, 1946

★



★ Some contractors still like to drag their greasing equipment around

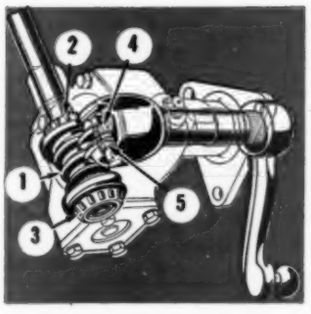
★ Blading to give the final dressing. Only one grader was required on this simple clean-cut outfit, which included also two 24-yd. and four 12-yd. tractor-drawn scrapers and a single push dozer

REGISTRATIONS *SHOW* IT — OPERATORS *KNOW* IT!

"FORD TRUCKS LAST LONGER!"

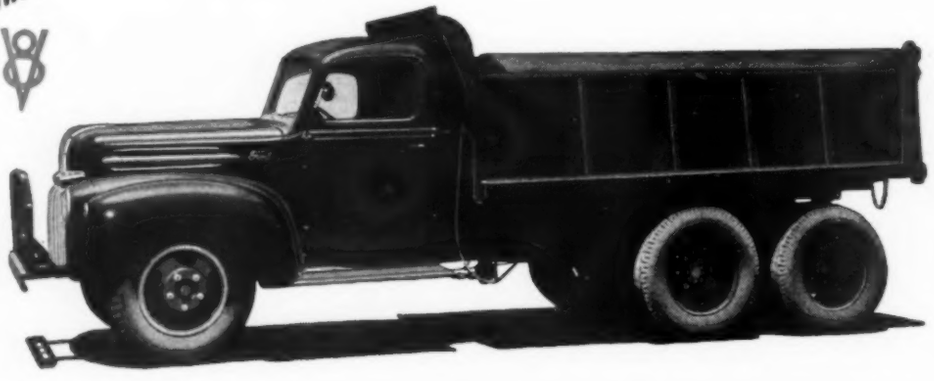
ONE big reason— FORD STEERING STANDS UP!

Ford worm-and-roller steering gear reduces *rubbing* friction to a minimum. *Rolling contact* is employed to reduce friction at five vital points. This spares muscle and saves wear. The worm gear (1) is straddle-mounted on two large, opposed, tapered roller bearings (2 and 3). The worm acts upon an easy-turning roller instead of a common sliding cam or split-nut, and this roller is mounted on two needle-type roller bearings (4 and 5). Bearings of both the worm and the sector shafts may be adjusted, thus promoting long life and proper action with less replacing of parts.



Ford

THE 6 YOUR PICK OF POWER THE V-8



A popular adaptation of the basic Ford heavy duty chassis —equipped with Fabco Dual Drive and 6-Yd. to 7-Yd. Dump body, now in service in Concord, California.

ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the V-8 or the Six—semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (¾-floating in half ton units, full-floating in all others)—heavy channel section frames, *doubled* between springs in heavy duty models—big, easy-action brakes, with heavy, cast drum surfaces, non-warping and score-resistant —extra-thick sheet metal in cabs, cowls, skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering.

That's why FORD TRUCKS LAST LONGER . . . why, as the national truck count for 1946 just released shows, *more than half of all Ford Trucks in use are at least 9 years old* . . . why there are more Ford Trucks in service now than ever before in history. More than 100 body-chassis combinations to choose from. Ask your Ford Dealer.

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

Assembly Line Road Planning

urged at ARBA Convention at Chicago

Successful meeting marked by exceptionally good technical papers, along with emphasis on broad industry and engineering problems. Town Hall Meeting on Airports a feature

THE engineer shortage and the need to somehow get plans completed for large lettings by mid-year, emerged as the biggest single problem touched on at the American Road Builders' Association 44th annual convention, held Feb. 17-20 in Chicago.

Speaking on the states' part in expediting the highway program, C. W. Phillips of Tennessee, president of the American Association of State Highway Officials, urged that every state highway department try to get any remaining part of its first year's federal-aid postwar program under contract by July 1, 1947. Should Congress extend the deadline by which federal funds must be taken up, even then the states owe it to hard-pressed motorists to speed up their plans preparation by every possible means, said Mr. Phillips. To this end highway departments should utilize short-cut "assembly line" design methods, with greater standardization of plan details. Programs should be determined, submitted and approved as far in advance as possible, and plan changes rigidly minimized.

Mr. Phillips went on to show how the automobile has always kept ahead of highway development, and to stress the need for states to plan far into the future. Coordinated programs must be based on analysis of need, with increased attention to traffic data, road use surveys, origin and destination studies, and road inventories. Correct answers lie in such information and may also be locked up in the laboratories...the initiative of individual engineers must be encouraged, and engineers must learn to look beyond purely technical problems to practical answers in speeding their programs.

ARBA's Growth Outlined

Retiring president, James J. Skelly, of Media, Pa., before turning the gavel over to Tom Calloway of Goodyear, reviewed the Association's recent activities and told of its growth, pointing out that it has broadened its field of endeavor and increased its membership. He paid particular tribute to the able manner in which technical committee work has been revived since the war under the general chairmanship of H. F. Clemmer. He also told of the rebirth of ARBA's Airport division under Walter R. Macatee; continued strengthening of the American Institute of Local Highway Officials, under the Association's County Road Officials Division; renewal of the Inter-American Highway Engineering Conference under which ARBA cooperated with governmental and other agencies to bring Latin-American students to the U. S.; and other association activities.

Among the 120 listed speakers and discussion participants also were such national leaders as Maj. Gen. Philip M. Fleming, federal works administrator; Paul Cunningham, member, public works committee and chairman subcommittee on roads, U. S. House of Representatives; H. A. Hook, assistant administrator, Civil Aeronautics Administration; J. Glenn Beall, member of both foregoing House committees; Congressman Jesse Wolcott and H. Carl Anderson.

Road Building Outlook

The goal of a stabilized, long-term highway program must command every effort, said PRA Commissioner Thos. H. MacDonald in a paper delivered by Deputy Commissioner H. E. Hilts. He pointed out the broad business ramifications, showing that not only road machinery and material makers and contractors depended on road work for a livelihood, but that highways create a market for many of our largest business concerns such as the petroleum companies and automobile and tire manufacturers.

Problems confronting us all in attaining a full and steady road construction level are:

Rising prices—The composite price index per mile of road compared with average costs for the 1925-29 period was, 119.3, 117.0, 122.1, and 133.3, respectively, for the four quarters of 1946. These indices compare with the 1940 index of 71.6, reflecting a rise of 66%, 63%, 70% and 86% above 1940. It is obvious that the construction program will not be stabilized in a rising price market.

Apparent lack of contractors—During the 1935-46 period there were 5,614 contractors performing federal-aid road construction. During the 1940-46 period the average was 3,047, or an apparent disappearance of 2,557 firms. Many contractors are now returning to the highway field, more are expected. During 1946 some 350 new contractors who had not previously done federal-aid road work entered the field, according to incomplete tallies. Fewer and fewer bids were received per project or letting as the year advanced, however.

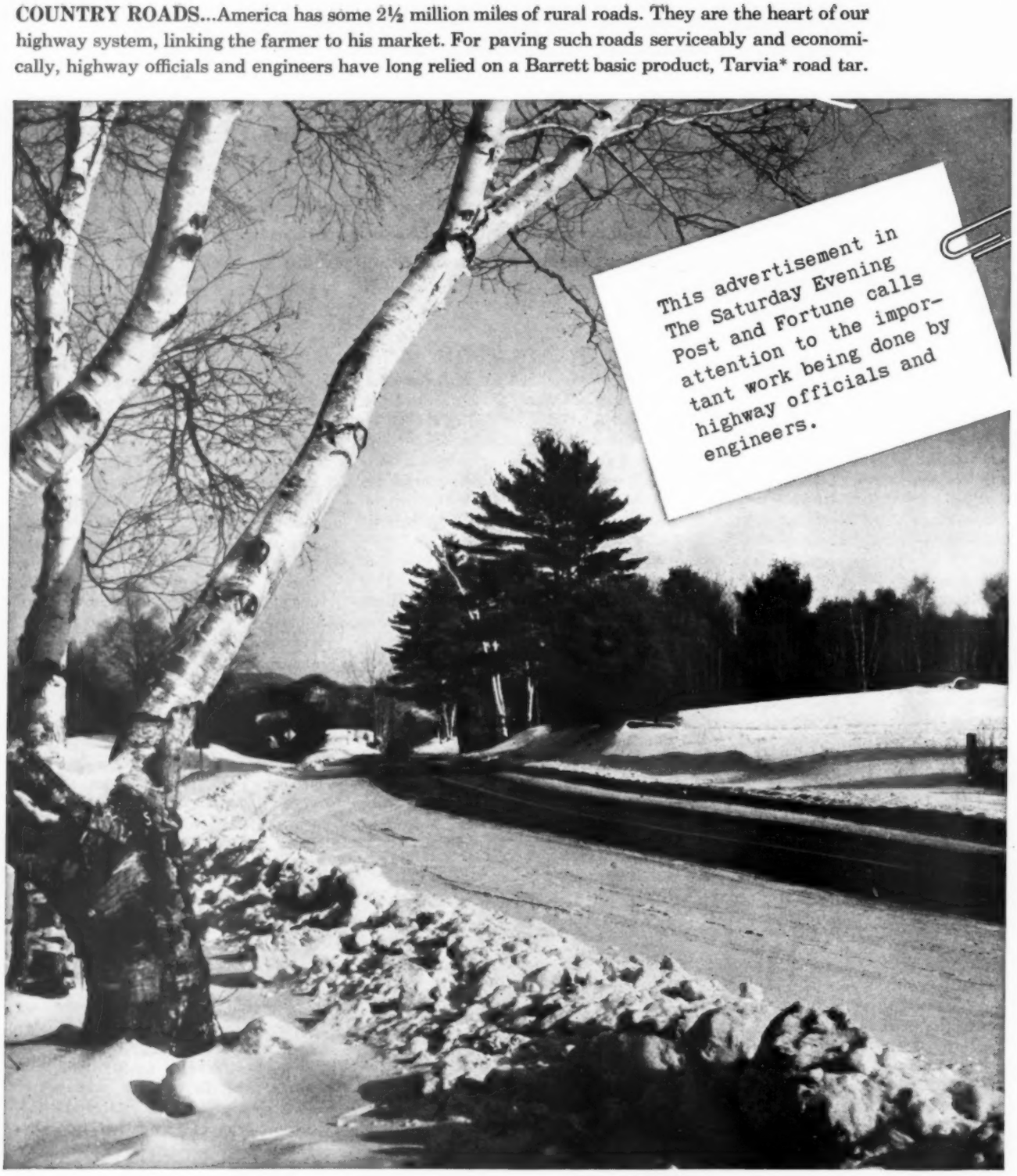
Rejection of bids—Of $659 millions in federal-aid work offered, contracted or award pending, 19.1% were rejected by the states and 2.3% by the Public Roads.

Lag in projects—Of 3,500 contracts under way at year's end, 25% were behind in production. Reasons given in a questionnaire among field engineers were: Labor 10%, management 19%, equipment and materials 31%, combination 24%, weather 14%, miscellaneous 2%.

Outlook for materials—Materials, hence, and equipment, led the list of delay causes. Commissioner MacDonald, however, could promise improvement only in general terms. Cement is scarce at present in certain areas, but after the first quarter should be amply available for the state's road requirements. Bituminous materials continue to be ample. Lumber scarcity, too, will abate.

Unit contract prices — While the weighted averages of all prices have

COUNTRY ROADS...America has some 2½ million miles of rural roads. They are the heart of our highway system, linking the farmer to his market. For paving such roads serviceably and economically, highway officials and engineers have long relied on a Barrett basic product, Tarvia* road tar.


This advertisement in The Saturday Evening Post and Fortune calls attention to the important work being done by highway officials and engineers.

ONE OF AMERICA'S GREAT BASIC BUSINESSES
Paving Materials . . . Building Materials . . . Wood Preservatives
Protective Coatings . . . Coal-tar Chemicals . . . Nitrogen Products

Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N.Y.

*TRADE MARK REG. U. S. PAT. OFF.

REMINDER TO ROAD MEN. Now is the time to check the condition of all the roads in your territory. If any have been damaged by winter frosts and snows, investigate the economy of putting them back in first-class shape with the help of Tarvia* road tar. Ask the Barrett field man.

gone up, wide variations are shown in individual items among contractors' recent bids. For example, while common excavation is up 60%, borrow is up 115%, contrary to our belief that the efficiency of hauling equipment has been increased. [Note by editor: Due often to dependency on unreliable rental sources?]. Common dry excavation is up 110%, although excavating equipment certainly has been improved and has replaced higher cost methods widely. Bituminous surface treatment shows the lowest rise—only 15%. Structural concrete is up 94% for superstructures, inconsistent with the 101% rise for footings and foundations.

Such inconsistencies in weighted averages, revealed only by study of masses of data, are ample justification for the much criticized policy of PRA in requiring an analysis of costs to be submitted in support of bid prices, said the Commissioner.

Airport Panel a Success

Many of us had misgivings when we heard that 34 speakers were to be crowded into one morning session, as was the plan of the much publicized Town Hall Meeting on Airports. However, the affair went off well, and much meaty information was divulged to a large and attentive audience. The credit is shared by W. R. Macatee of the Road Builders and by Col. Floyd Evans, director of the Michigan Department of Aeronautics, who acted as the moderator. Covering questions and prepared answers on a wide range of subjects, from legislation to terminal planning to soil mechanics, this series of short state-

Get Right of Way Now!

. . . warned Thos. H. MacDonald at the ARBA meeting:

The highway construction industry is deeply affected by the lack of stabilization of the public works program on a long-term basis. It is important that highway officials, contractors and all of the construction industry take thought for any contingency that might require an expansion of public works. We do not wish again to be unprepared to the extent that work relief expenditures shall go into unplanned and unprofitable undertakings.

Great strides have been made in planning the road program ahead. There is one essential element, however, that has constantly imposed great delays upon the actual undertaking of well planned improvements. This is land acquisition.

Too often in the past, the character of road improvements undertaken has been governed by the limitations of shortsighted land acquisition measures. When the acquirement of land is postponed, as usually it has been, until the very moment of need for construction purposes, it is often discovered that the land actually wanted cannot be obtained without long delay. Time pressing, plans are altered to require less land, and in the end it is found that too much has been paid for inadequate takings.

There are two principal causes of the conditions: One is the failure to plan and provide funds for land purchases sufficiently in advance of road construction. The other is the cumbersome and time-consuming land acquisition process prescribed by the laws of many States. If the rebuilding of Federal-aid routes, and the construction of the National system of interstate highways and other expressway facilities are not to be hampered by right-of-way compromises, both of these causes must be recognized and remedied.

Provision has already been made by the Congress in the Defense Highway Act of 1941, Public Law No. 146 of 1943, and the Federal-aid Highway Act of 1944, for the survey and advance planning of highway construction projects, and the acquisition of necessary rights-of-way. The further need in remedy of the first of the causes mentioned is the similar and sufficient appropriation of immediately expendable funds by some States and their subdivisions for the advance acquisition of the necessary lands.

An adequate remedy for the second of the causes referred to will require the more difficult revision of legally established methods of public land acquisition in some States. The common defect of many of the varied methods used to acquire right-of-way, is that they postpone the public possession of required lands until the compensation due private owners has been finally determined by legal processes which involve many possibilities of delay and obstruction.

An illustration of the time that may thus be lost between the commencement of condemnation proceedings and the beginning of construction operations occurred in the widening of Woodward Avenue in Detroit, Mich. Delay of almost a year and a half was occasioned in this instance largely by the death of a juror which invalidated the whole procedure and required a new trial to be instituted. The case cost the city of Detroit $100,000 and the public was deprived of the benefits that would have resulted from an early completion of the improvement. While other elements may have contributed to the delay, such as the very requirement of a unanimous jury, indiscriminate adjournments, and lack of supervision by the court, provision for early possession pending the action would have facilitated the completion of the project.

Fortunately there are among the methods in use, a few recently developed and closely similar in their essential requirements, that avoid these delays and yet afford ample protection of the rights of private property owners. Where these methods obtain, as in New York, for example the condemning public authority, following required preliminaries, and after notice to the owner of such action, the appropriation is complete and title to the property vests in the State. If offers of the condemner are then rejected, the former owner must file a claim for the value of the property with the State court, which makes an award after hearing all the evidence.

In the absence of adequate provision of this character, the rebuilding of Federal-aid routes and the logical development of the National system of interstate highways will inevitably be subject to long and costly delays and litigation, and public benefits of the needed facilities will meanwhile remain unrealized.

It is perhaps unnecessary to emphasize so strongly before a group which has experienced so many delays in their operations, the importance of the long acquisition program and the revision of archaic laws governing the procedures. Both the public and industry will benefit by a correction of this situation.

ments is too long to be included in this report. A later issue of ROADS AND STREETS will cover in some detail.

However, we should take space here to mark with some satisfaction the role that the ARBA has assumed in the civil engineering and construction end of airport development. Ninety cents on the dollar of the modern airfield goes into grading, drainage, paving and lighting. The builders of roads are also the builders of airfields, using the same equipment and solving the same problems in many respects. The two fields of endeavor cannot be too strongly united.

Airports were represented on the general program of the Convention by L. L. Shroeder, president of the American Association of State Aviation Officials, speaking on the responsibility of the states in the airport program.

Local and Secondary Roads

W. Bruce Chilson, Falconer, N. Y., was elected president of the ARBA's County Highway Officials Division for the coming year. Retiring President Paul B. Rynning, of Medford, Ore., reported greatly increased activity of this division. Among the important developments in the secondary road field during 1946 he pointed to PRA's appointment of an 11-man board of consultants, drawn from leading county engineers. Acting as advisor to PRA and serving as liaison men with their state highway department, members of this group have held meetings with local road officials in some PRA division areas.

Formation of the American Institute of Local Highway Administration a year ago was another big step forward. This group represents only state associations of local road administrators. Its membership is limited to three men per state, based on affiliation of the state group with ARBA's County Division. Fourteen states are now members and others will soon be, the expectation being that three-fourths of the states will be represented within another year.

The County Division itself is also growing, having added 488 new memberships, including five state associations in 1946. H. K. Bishop, formerly of PRA now heads this group.

In commenting on need of membership in the Institute, A. O. Cuthbert, of the County Road Association of Michigan, outlined the original purposes of the Institute. Local roads cannot be properly administered and benefits obtained for them without a united national front, just as such a front is needed for state highways and for urban facilities.

Mr. Chilson added emphasis to the importance of all county highway organizations coming into the Institute. The Institute represents policy making officials (commissioners, judges, supervisors) as well as engineers and superintendents. The combination of these groups, working together for a common cause, cannot help but constitute a force for the betterment of local road programs, he noted. He cited as one goal the elimination of duplication of effort on local roads—as in Michigan where the state is the administrative and the county the operating agency on virtually all highway work.

A strong program on local road administration was further rounded out with a paper by John A. Long, former head of ARBA's county road division and now executive secretary of the Florida Road Builders' Association; also talks by J. M. Evans of Minnesota, and by Ben F. Ostergren and Frank Pace representing the rural letter carrier interest.

Many Technical Papers

So many technical reports and discussion periods were included in the program that we can only single out a few at random for brief high-lighting.

"Structural Features of Concrete Pavements." T. J. Kauer, managing director, Wire Reinforcement Institute, on this subject acted as a committee chairman to pass along a profusion of questionnaire data on state specifications. States on pavement designs still vary more than they have any valid reason to. Even discounting differences in prevailing climate, traffic conditions, etc., it should be remembered that engineering principles are the same anywhere. Pavement research must continue, said this author, and a real effort made by highway engineers to get closer together on design details.

As a plug for reinforcement we might quote the paper in reporting that distributed reinforcement for the control of cracks is now used in 37 states of 46 reporting, three more states using it under some circumstances such as for resurfaces, poor subgrades, and for bridge approaches. Thirty-two of 37 reporting use welded wire fabric, 15 also using bar mats; two others also use expanded metal; 24 in all use bar reinforcement; nine states in all use expanded metal. Details of use and weight per square foot also vary bewilderingly, the weight per 100 sq. ft. ranging from 30 to 86 lb. and averaging 54 lb.

Slab cross-section is still another variable. Uniform thickness sections now predominate, used by 30 of 46 states reporting, some of which also use the thickened edge. The tendency away from the thickened edge is apparently due to the fact that lane widths of 22 and 24 ft. do not place heavy concentrations of traffic on lane edges, as was the case with 18-ft. slabs. Subgrade preparation difficulties also are a reason. Eight states build 8 in. uniform concrete, eleven states 9 in., four states 10 in.

Flexible Pavement Design

Trends in the design and construction of flexible type pavements were covered by Bernard Gray, general manager, Asphalt Institute. This factual committee report, also based on state highway department questionnaires, indicated that marked dissimilarities remain in the specifications. Particularly with respect to thickness, crown, and type of mix employed, the states adhere to varying practices not entirely explainable by local conditions. Mr. Gray suggested changes in standards that might contribute to better design and workmanship. Since present depths allowed or required range from one to 8 in., elimination of the extremely thin and thick dimensions is an obvious place to begin. The minimum is seldom good engineering, and the facts show that composite pavements less than 8 in. thick often give good service.

Many states give little attention to control of stability and density of mixtures. In recent airfield studies it was shown that the angle of stress distribution actually existing in bituminous concrete may vary from 0 to 58% degrees, depending on the composition.

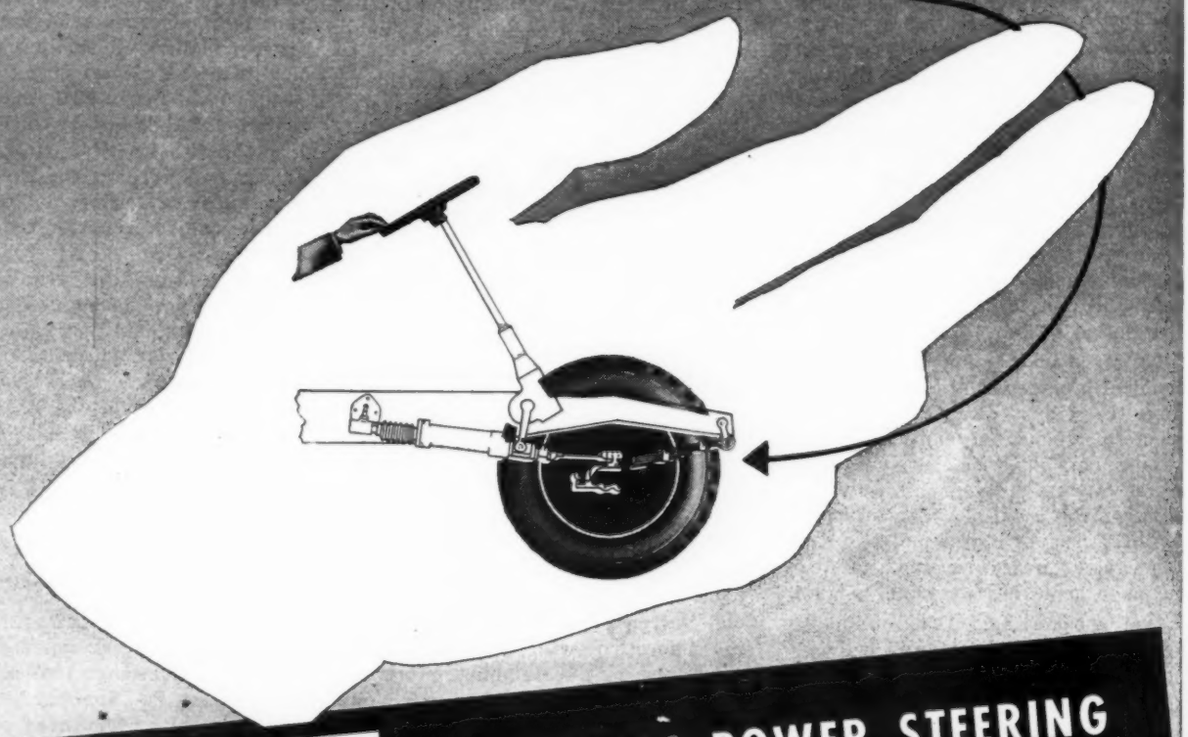
Soil-Cement Reports

Two papers were given on soil-cement. Miles D. Catton, Portland Cement Association, presented a committee report in question-answer form. Based on experience with this type now totaling over 48 million sq. yd. since 1935, answers were given for 36 topics. J. M. Grady, city engineer, Columbus, Georgia, told of soil-cement methods used in his city, where a 74,000 sq. yd. program has been carried out in the past three years. Contract costs were reported as varying from 54 to 65 cents per square yard in 1944, depending on cement content (7% to 11%), 62 to 65 cents in 1945, and 64 to 87 cents in 1946.

Paving Problems

On bituminous work it makes little practical difference how you prepare

INSTANTANEOUS FINGER-TIP RESPONSE



with VICKERS HYDRAULIC POWER STEERING

Two fingers on the steering wheel—it turns easily, and the front wheels of the heaviest truck or bus follow exactly. Vickers Hydraulic Power Steering does the work. And steering is just as easy over the roughest ground off the road as it is on smooth concrete. Road shock *cannot* be transmitted from the front wheels to the steering wheel or driver.

Steering is instantly responsive and firm—no rubbery feeling or wander. The driver is relieved of the most exhausting part of his job, enabling him to get more done with less fatigue.

Vickers Hydraulic Power Steering has many other advantages: (1) requires minimum space and is applied to most existing hand steering mechanisms with a few simple alterations; (2) automatic protection against abuse and excessive steering reaction forces; (3) automatic lubrication; (4) 15 years of successful operating experience. Ask for Bulletin 44-30.

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REPRESENTATIVE APPLICATIONS OF VICKERS HYDRAULIC POWER STEERING

the mix, according to George H. Dent of the Asphalt Institute. Mixed-in-place and centrally mixed pavements have both shown good performance, and the choice is a matter of contractor preference. There is a definite need for mechanical equipment in placing macadam aggregates for widening work. Hand raking of stone is a costly chore today. Bigger driers are needed on most jobs than are usually in evidence today, also noted Mr. Dent.

Among other phases of concrete road construction touched on, Charles W. Allen of Ohio covered forms. Forms as made today are generally considered adequate, but a problem frequently reported is that of giving forms a secure foundation when a granular blanket extends under the forms to the shoulders. All form sections should be securely locked, and 30-in. pins used under such conditions.

Larger pavers than 34-E are a doubtful prospect, said Mr. Allen, but there is still a demand for faster concrete production, and continuous mixing methods will continue to be investigated. Greater uniformity in mix control is also widely needed; use of 3 sizes of coarse and 2 of fine aggregates was proposed as one means of achieving better uniformity.

One speaker said that prolonged agitation during transit-mix delivery possibly reduces the air content in air entraining concrete, and suggested further research in the use of non-agitating types of truck bodies for concrete delivery. Concrete consistency, vibratory methods, and other topics rounded out this discussion.

Street Assessments

Questionnaire data from 73 cities on trends in the practice of assessing property owners for street improvements were reviewed by James B. Wilson, of Louisville, committee chairman. Cities of all sizes were covered; 86% said their city defrayed street construction costs thusly: 84%, "yes" for sidewalks; 69% for alleys. Only 11% for grade separations; 7% for street maintenance; 10% for fire hydrants. But 54% of the cities assess for trunk sewers and 78% for laterals.

In two-thirds of the cases reporting, assessments are set by state rather than municipal laws. Most cities determined assessments on a basis of front-foot value (30%), area of property benefitted (21%), or cost of work on the property (12%). However, Chairman Wilson interjected the personal opinion that the frontage method of apportionment is inequitable, working particular injustice to corner lot owners and along unimproved property.

Pavements in Car Track Zone

A committee report on street construction and maintenance as related to street railways and other subjects was given by Henry H. Kranz, city engineer, Cincinnati. Drawing from a series of articles prepared by municipal executives in his city he listed several constructive thoughts. Some of these:

Monolithic construction with welded rail joints and solidly encased rails is an improvement over the old concept of a separate track structure, and seems to have eliminated most of the causes of track and pavement failure.

Street car loading areas alongside arterial car stops have developed from simple marked-off areas to raised concrete platforms protected by an axle-drag prow and day-and-night flashing arrow warning signal.

Further research is needed to develop designs of sewer inlets and rules for installation in hilly cities such as Cincinnati.

In preserving the large mileage of old streets, surface treatment and surfacing using mechanical equipment have been the mainstays. Special research has been carried out in connection with routine yearly programs, in a continuing effort to improve the quality of repairs on asphalt, block, macadam and concrete. Studies to determine the value of light oil treatment of new concrete to increase resistance to de-icing salt action is one example.

Downtown Parking Problems

George M. Shepard, city engineer, St. Paul, gave a committee report on traffic congestion and parking problems in central business districts. One section of his detailed paper discussed "on-street parking," or curb parking as we call it out our way. Whether by parking meters, rigid limitation by other means, or complete elimination of such parking, it has become clear that drastic reduction in parking is one of the first steps that must be taken in many of our larger cities. That, of course, focuses increased attention to off-street parking, a problem much in the news lately with encouraging developments expected in certain cities.

Weight Limitations and Growth of Trucking

During a symposium on weights and dimensions of vehicles a paper by C. A. Weymouth, Associated Transport, Inc., cited examples of the cost penalty passed along to buyers of truck-delivered goods in certain states due to alleged unfair truck restrictions. In Kentucky, for example, a cost penalty of 46% results from axle limitations which often force the use of two trucks instead of one to deliver a consignment over the highways.

Verne M. Drew of Fruehauf Trailer Co. and the Truck Trailer Mfrs. Assn. reported that commercial haulage has risen from 18 billion ton-miles annually in the 20's to 59.6 billions in 1940, 85 billions in 1946 and an estimated 125 billions by 1950. This growth, with its vital public service, is still hampered by the existence of a bewildering variety of restrictive legislation, different for each of the 48 states.

Proposed uniform regulations to govern future commercial traffic on the Inter-regional system, as drawn up by highway officials, have been accepted by trailer and truck manufacturers with certain reservations. The rules are criticized as applying more appropriately to bridges than pavements and neglecting such basic facts as the advantage of dual axles in reducing load concentrations.

Bridge Bottlenecks

Bridge limitation came in for discussion, with the recommendation by a trucker spokesman that all bridges of a state be appraised for load capacity and a program of bottleneck elimination launched. The Association challenges present bridge standards as often unduly penalizing the public through limiting truck haul.

Truck mixers entered this discussion, H. F. Thompson of the National Ready Mixed Concrete Association stating that there is a trend toward larger capacity truck mixers but still no standardization. Operators are branching out from cities more and more into rural areas.

Motor buses must be considered as an entirely separate traffic problem from trucks, said L. H. Rossman, National Association of Motor Bus Operators. In making a plea for permission to build buses with wider bodies (up to 102 in.) he pointed out that only one bus uses the rural highways for each 1500 cars and 300 trucks; an occasional bus hence causes relatively little disturbance in traffic flow. Wheel loads likewise are not a critical factor in considering bus limitations.

Bus travel has become progressively cheaper (now under 2 cents per passenger-mile ticket cost) while increasingly serving the 7.5 million families who do not own motor cars.

Equipment Market Danger Top Subject at AED Convention

EQUIPMENT men—the guys who distribute it and also the manufacturers—milled around the halls at Edgewater Beach Hotel last month at their annual convention. Nearly two thousand of 'em, which is some turn-out.

What was on their minds? Quite a lot of things, of course. But No. 1 was the bombshell news that a flock of war surplus road building and construction machinery was headed toward U. S. shores. F. Salditt, vice-president of Harnischfeger Corporation, presented the details, along with Mr. Moyer of the AED field staff revealing that speculators had acted quickly after the January 18 government order which lifted the ban on re-importation of certain items. This subject and what it means to highway officials, engineers and contractors, is covered in a special editorial elsewhere in this issue of ROADS AND STREETS.

William A. Danner, of Parker-Danner Co., Boston, Mass., was elected president, succeeding F. B. McBath of Portland, Ore. A. F. Garlinghouse, Los Angles, Calif., was elected executive vice-president, and Eldon M. Farnum, St. Louis, Mo., was elected treasurer, succeeding W. W. Bucher, New York, N. Y. Newly elected vice-presidents were V. J. Sheridan, Ontario, Canada, and H. L. Burleson, Dallas, Tex., and C. F. Halladay, Sioux Falls, S. Dak., was re-elected vice-president.

The continued growth of AED was shown by a membership report by C. L. Wooley of Providence, R. I. The Association now has over 1100 members, including 567 active, 240 allied, 49 associate and 64 foreign.

Closed Shop Urged

In recognition of the increasing unionization of road and construction workers, the program committee gave space to this subject. Roger G. Slaughter, former Democratic congressman from Missouri, urged outlawing of the closed shop in American industry. His eight point labor program also proposed to outlaw industry-wide bargaining, mass picketing, secondary boycotts, jurisdictional strikes and unionization of supervisory employees; hold unions equally responsible under the law for breach of contract and other irresponsible acts; and require union registration and full financial accounting with the NLRB.

Tighter Installment Terms

Now, while the construction equipment business still is in a seller's market, is the time for dealers to establish terms which will stand reducing when the day of the buyer's market arrives again and keen competition demands a loosening up in order to bring in the business, recommended Kenneth R. Wells, assistant vice-president, American National Bank and Trust Company of Chicago, one of the Convention speakers.

He also warned distributors against putting too much money into fixed assets and new stocks. The dealer should always consider whether he could survive if business suddenly dropped off and should be willing to do a little less business in order to protect that which he has already accumulated.

H. E. Foreman, Managing Director, Associated General Contractors of America, Inc., predicted a "record-breaking dollar volume of activity, provided the problems facing the industry are solved successfully." Construction costs, government regulations, construction labor, day labor, and portal-to-portal pay all present problems which must be solved by the construction industry, according to Mr. Foreman.

Trained Engineers Needed

In a fact-packed address Charles M. Upham, Engineer-Director, American Road Builders' Association, told of the size of the road program needed and in prospect. He also spoke of a shortage of engineering personnel which presents "serious implications."

"Lack of trained engineers in the state highway departments constitutes one of the greatest deficiencies in the over-all program. A further increase in salaries is needed to bring trained engineers into the highway field," Mr. Upham declared.

A list of eight proposed short range and ten long range objectives for the Association to work for were submitted by Hal M. Davis, Chairman of AED's Planning and Promotion Committee. Mr. Davis announced the proposals would be referred to the Board of Directors for approval.

AED Resolutions Passed

Three resolutions were adopted by the Association as follows:

1. Construction By Contract Method. "The Association recommends, in the interests of efficiency and economy, all Federal, State, County and Municipal construction work, when possible, be performed by the award of contracts to the lowest qualified responsible bidder."

2. Apprentice Training. The Association "does hereby endorse and pledge its support to the Apprentice Training Program of the Associated General Contractors of America, the American Society of Civil Engineers, United States Department of Labor and other sponsors of similar programs within the construction industry."

3. Escalator Clause. "The Associated Equipment Distributors recommends that the manufacturers eliminate immediately the escalator clause on all acknowledged orders which carry a promise of delivery of, on or before 120 days from date of acknowledgment, regardless of when the shipment is actually made."

•

Distribution of Highway Traffic Accidents

Motor vehicle traffic accidents in Minnesota in 1946 caused the death of 537 persons and the injury of 15,968. An analysis of the location of these accidents by the Minnesota Highway Department brought out the following:

The distribution of fatalities was 20.7% in the three large cities of the state, 22.3% in smaller cities and villages, 41.5% on rural trunk highways and 15.5% on county and local rural roads. Of the injuries, 38.2% were due to accidents occurring in the three large cities, 22.4% in smaller cities and villages, 28% on rural trunk highways and 11.4% on other rural roads.

•

Motorists who think of American highways as typified by the Pennsylvania Turnpike or Davison Highway will be surprised to learn we have in the United States only 5,191 miles of 4-lane type, 736 miles of 5-lane type and some 300 miles of 6-lane. It is proof of the size of our highway widening problem to note that these 4-lane and upward roadways are only .015% of the total rural mileage.

Seen at Recent AGC Convention

Chicago, Jan. 27-31

★ New A.G.C. officers for 1947, left to right, D. W. Winkelman, Syracuse, N. Y., D. W. Winkelman Co., vice-president; H. E. Foreman, Washington, D. C., Managing Director; F. W. Parrott, Sioux City, Iowa, C. F. Lytle Co., President

★ (Left): George H. Atkinson, San Francisco, Calif., chairman, Heavy Construction and Railroad Contractors Division for 1947; Commodore Charles T. Dickeman, Superintending Civil Engineer, Bureau of Yards and Docks, Chicago, Ill., representing Rear Admiral J. J. Manning, Chief, Bureau of Yards and Docks; Thomas H. MacDonald, Washington, D. C., Commissioner, Public Roads Administration. (Right): Officers of Highway Contractors Division, Harry J. Kirk, Washington, D. C., manager, Highway Contractors Division, Gayle Armstrong, Roswell, New Mexico, division chairman for 1947; Morris E. DeWitt, Poplar Bluff, Mo., chairman for 1946

★ At this table (not in order seated): Richard Hopkins, contractor, of Albany; Mr. and Mrs. Don Davis, Binghampton Const. Co.; Thomas Forrestal; J. E. O'Connor, of J. C. O'Connor, Indiana contractor; Mrs. Eugene Forrestal; H. J. Kirk, manager, highways and airports division of AGC, Washington

★ (Below): Seen here are Roy A. MacGregor, exec. secy., Constructors Ass'n of W. Pa., with Mrs. MacGregor and a party of Pittsburgh and Detroit contractors

★ (Above): One of the Iowa tables—beginning on extreme left: O. W. Crowley, exec. secy. Iowa chapter of AGC; Mrs. W. R. Miller; A. F. Mathes, Des Moines; Mrs. Crowley; Herman F. Cole of Ben Cole & Sons, Ames; Mrs. J. Leo Hook; R. W. Miller, John G. Miller Const. Co., Waterloo; Mrs. Cole; J. Leo Hook of Hook Const. Co., Des Moines; and Mrs. Mathes

...with this new Pesco Hydraulic Motor

If the operation of your equipment calls for the use of a hydraulic motor that can deliver better than 90 per cent torque efficiency in starting, it will pay you to get full information regarding this new Pesco Hydraulic Motor. Built to Pesco's high standards of technical excellence, it features in addition to its high starting torque efficiency, dual rotation, smooth operation, minimum parts and long life. It is non-stalling and exceptionally light in weight.

Its high starting torque efficiency makes it possible for this Pesco development to operate faster and more economically than conventional hydraulic motors. Its fewer parts mean minimum service requirements. Its light weight is a real advantage on any equipment on which it is installed. And, it provides a smooth, pulsation-free flow of power.

Built in sizes from 50 to 600 pounds inches torque, this motor will operate at working pressures up to 1500 p.s.i. and at operating speeds from 0 to 4000 r.p.m. For complete information regarding this, or other hydraulic power needs, write Dept. 37-E, PESCO PRODUCTS DIVISION, Borg-Warner Corporation, 16610 Euclid Avenue, Cleveland 6, Ohio.

In Precision Hydraulics, Fuel Pumps, Air Pumps, Related Accessories and Aircraft Electric Motors . . . Performance Points to PESCO First.

Pesco PRODUCTS DIVISION
BORG-WARNER CORPORATION
11610 Euclid Avenue
Cleveland 6, Ohio
MANUFACTURERS OF BW SUPERCHARGERS

★ Discing to break up fragments of loosened sod before blading over the shoulder line—considered important on this Iowa patrol to insure smooth going later for the power mower

★ A preliminary pass with scarifier teeth was necessary because of the dryness of the season

From the Editor's Notebook

Springtime Shoulder Maintenance in Iowa

LAST March (1946), while driving along US 65 in Iowa, the ROADS AND STREETS editor happened on a state maintenance patrol crew busy getting shoulders fixed up for summer. The accompanying pictures were snapped at the time to show an example of the many and varied problems of shoulder maintenance experienced in the middle-west.

The problem here was to reduce the shoulder elevation, which had built up during the previous summer and winter through a combination of root growth and frost heave, principally the latter. The shoulders consisted of ordinary gravelly clay soil, and a fairly good turf had developed. There was the usual strip of bare ground next to the slab, where motorists and

★ A neatly bladed shoulder, ready for grass to spring up again. Note row of sod fragments bladed just over the shoulder line at extreme right

★ Built-up shoulders were also loosened for cutting down by using a tow-type multiple disc outfit

★ (Left): Lip curb on inner sides of curve. There is about an inch of drop-off in shoulder elevation here—soon fixed up, however, by the on-coming crew. (Right): Typical run-down at the end of a curve, a familiar part of Iowa road design

truckers along this busy arterial had run off the pavement in passing the "wide fellows."

The main object was to cut the shoulder elevation down to pavement level and re-slope the shoulder to drain toward the ditches. The practice observed was to take a work section of convenient length—several thousand feet—and go over it lightly several times. This happened to be a period of exceptionally dry weather, and the soil first had to be loosened by a grader pass using scarifier teeth. Then followed from 2 to 4 blade passes after which—and this was considered especially important — the loosened sod was well disced to break up large sod fragments. Then the blade came along again and worked the loose stuff over the shoulder edge, leaving the shoulder with the desired transverse slope.

The purpose of discing was to insure that no clods left along the ditch slope would be too large for passage of the mower later on. The foreman here had previously tried performing the necessary shoulder reduction in one heavy blade pass, but had found it more satisfactory in this soil to make several light blade and disc passes, as noted. The sod roots were not entirely destroyed, and it was expected that a good turf would develop by June.

Noted in these scenes also is the low curb which is part of Iowa's standard concrete pavement design. This curb is used on the lower side of curves and on grades, to confine surface water until it reaches a rundown, an example of which is likewise pictured.

In addition to frost and root buildup, the Iowa shoulder problem has sometimes been aggravated in the past by the practice, followed here as well as in many other states, of building shoulders too high to begin with. State maintenance engineer W. H. Root states that Iowa maintenance men have had to learn from experience that shoulders but 2 or 3 inches high at the time of road construction do not always settle as allowed for, but must later be skimmed down. Instead of settling, they often have built up, and in 1946 many such shoulders were cut down after waiting through several wartime years to get around to the task.

Quoting Mr. Root, "We aim to do most of this shoulder cutting in the early spring months, as soon as the shoulders are firm enough to hold up the equipment. In this way, by the middle of the summer the grass comes back and you would never know the shoulders had been trimmed. We aim to get ½ in. per ft. slope from the slab edge.

Shoulder Problems Aired at Research Board Meeting

The Committee on Roadside Development in its all-day session in Washington, D. C., in December devoted much time to shoulders, their design, construction and maintenance. F. H. Brant of North Carolina told of his state's turf shoulder research. In discussion, participated in by committeemen from various Board departments, C. N. Conner of PRA dwelt on the types of shoulders needed on expressways, observing that the public wants grass for appearance but that shoulders must have stability for emergency use and that further experimentation is needed. Several Michigan representatives entered in a lively discussion, the conclusion being that grass shoulders needn't reduce the stability of a soil but may add to bearing power of some unstable shoulders.

Where traffic is likely to use shoulders, noted Prof. James Tyson of Michigan State College, shoulders should first be stabilized, then consideration be given to the best type of grass for the conditions and how to develop it. He told of stabilizing sand and gravel with common clay and loam, and experience with grasses successful in Michigan, but noted that conditions and hence turf types will vary everywhere. E. A. Finney of Michigan told of experimental turf plots and also of a state program to evaluate existing shoulders, in which turf and soil samples will be correlated with noted conditions. O. E. Eckert of that state noted the factors in shoulder design, which are soil texture, volume and character of traffic, and pavement width. Along 20 and 22-ft. pavements he concluded that engineers cannot hope to maintain grass to the pavement edge but must provide 2 to 3 ft. of stabilization. A change of maintenance treatment is needed on many 2-lane paved roads that will result in a 3-ft. strip of gravel, such a strip being necessary in his state for pavements up to 30 ft. wide due to width of dual truck wheels.

A soil having from 5% to 25% passing 200 mesh has proved able to

Farmers the land over must drive their trucks over miles of unsurfaced, secondary roads to get to the main highway with their produce. There are more than 2,000,000 miles of these unsurfaced farm-to-market roads, representing untold expense to farmers in time, truck repairs, accidents, and so on.

The 1945 Federal Highway Act provides funds to aid in the improvement of the more important of these roads. And Koppers Tarmac provides a durable and economical binder for use in surfacing such highways.

Include Koppers Tarmac in your plans for new highway construction and for resurfacing.

Write for the booklet "SURFACING WITH TARMAC," *describing construction steps for all types of surfacing.*

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makes good roads

develop turf and also provide high stability, was one Michigan conclusion.

Driver's Viewpoint

Shoulder conditions are a serious factor in accidents, said Burton Marsh, American Automobile Association. Research should be directed to this phase. Difference in level of shoulder and pavement is particularly dangerous. Motorists often fear and distrust grassed shoulders as being traps for unstable or at least unknown ground conditions hidden at the roots.

Dr. Monteith, of CAA, reported on shoulder problems in airfield runway design. He pointed out that turf grown in sand stabilized with lime rock has in some instances successfully carried B-29 traffic. Tying in with a discussion of transverse slopes needed to insure highway shoulder drainage, he said that in the case of airfields he has secured design changes when necessary to have runway shoulder slope 5% laterally for a distance of five feet, then 1½% from there on. Nearly flat shoulders create water catches and make runway and shoulder edges the weakest areas on the field.

Pennsylvania Rolls Shoulders

The problem of highway shoulder build-up and how to obviate or correct this condition that interferes with highway drainage was mentioned. W. H. Herman of Pennsylvania said that the best way to eliminate build-up (and hence much blade work) in their experience is to roll grass shoulders lightly with a 5-ton roller. When done properly rolling once a year or every other year will save maintenance expense and add measurably to stability. A 2 to 3-in. heave due to frost is not uncommon in Pennsylvania. When the grass is bladed off, erosion sets in quickly, and water pockets form along the slab edge. Some shoulders are rolled 3 ft. wide, others only 12 to 18 in. During two months in late spring state maintenance men get over several hundred miles of highway.

Ohio Brooms Grit

Ohio practice also includes rolling of shoulders, plus sweeping in some instances with an old fashioned rotary street sweeper, the latter being used to throw accumulations of ice control grit to the ditch. Much of the build-up in Ohio consists of foreign material. Build-up is also reduced by use of a weighted box drag having a series of offset blades which cut into the crown of the grass without destroying the roots. When employed early in the spring, such drag-blading is followed by a quick regrowth of turf without seeding or mulching. Ohio procedure, incidentally, is never to seed without mulching.

The importance of securing good drainage under shoulders was repeatedly stressed. Some shoulders built with impervious materials remain saturated all spring, especially along the toes of hillside slopes.

Better Shoulder Engineering

Many failures of shoulders, it was noted from an earlier committee report, are due to faulty engineering or construction. It is still not an uncommon sight to see shoulders built of just any waste material, hastily dumped to hurry "finaling".

Arthur Nichols of Minneapolis said shoulder design is a question of "To grass or not to grass". We must not let esthetics spoil straight thinking. Grass has been overdone in places. Appearance of a roadside can be made just as attractive with a stabilized strip.

Ohio practice is to provide shoulders of a type and material as dictated by traffic needs, then for the landscape department to grow grass if possible or feasible.

In discussing shoulder and road drainage, C. N. Conner of PRA said there are two schools of thought. One is to carry granular material clear across the roadway under the pavement and shoulders. The other is to provide a definitely pervious material in shoulders in an effort to keep ditch water out. He held no brief for either method, as long as drainage was definitely provided, since lack of it is the cause of most shouder ills and that "there are as many ways to provide drainage as there are highway departments."

Vermont Armors Shoulders

A Vermont spokesman told of his state's shoulder practice. Prior to ten years ago all shoulders were of natural soil. When cars ran off frequently, the practice on arterials was to provide a 12-in. depth of crushed granite with a tar cover through which grass was allowed to grow. Now the practice is to continue the road base clear to the ditch line, and stabilize shoulders with 2½ in. of asphalt. Shoulders are 8 ft. wide, of which 6 ft. has a penetration surface on a sub-base. Where roads carry over 2000 vehicles daily, the present answer is 12 to 18 in. of sub-base carried 3 to 4 ft. out, plus 2½ in. of asphaltic mix.

An excellent paper on New York state's practice in shoulder development was given by John B. Fleckenstein of the state's bureau of soils. In conclusion, Chairman Brant counseled engineers to evaluate their soils and conditions and to go ahead with workable methods without waiting for national standards of shoulder design which are still far in the future.

At the close it was broadly concluded that shoulders must be designed as part of the whole traveled way and that the landscape, soils, road design and other departments must cooperate to make shoulders an intimate part of the project.

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Frisco Bay Bridge and Tunnel Proposed

A joint Army and Navy board has recommended that the secretaries of War and Navy approve a combined tunnel and bridge across San Francisco Bay. A low-level structure would be involved, at a cost of possibly $261,000,000, crossing south of the present bay bridge. A controversial proposal to span the bay with a system of dams has been vetoed.

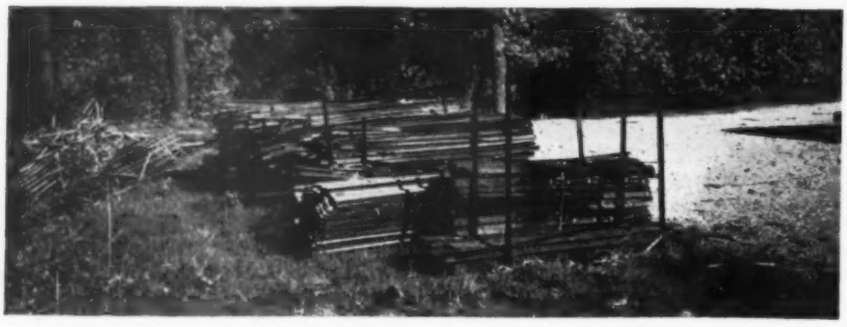
•

A long-range parking program to provide ultimately 26,000 parking spaces on a self-liquidating basis has been recommended by the Pittsburgh Regional Planning Association. A drastic program, result of long study, proposes a specific number of new parking facilities for shoppers and for office-worker cars, financed partly through ten millions in municipal bonds.

Mail Inserted Card or Inquiry Blank (page 132) for Equipment Data

Again this issue of Roads and Streets carries descriptions of many new labor-saving efficiency devices and latest material developments. See our New Equipment and Materials Section beginning on page 111, for which a numbered reply card has been inserted to help you request data on items that interest you. Also on page 132 is an inquiry blank and advertisers' index which will help you get data on equipment and materials you need.

JOB and EQUIPMENT IDEAS



★ (Upper): One of two large central storage yards for the county's 40 miles of fence
★ (Lower) Steel parts are also centrally stored. Cerro Gordo County has several modern garage and storage buildings for county road maintenance

How an Iowa County Stores Snow Fence

Shown in the two scenes is one of the two large storage piles of rolled snow fence, as it is stacked during the summer months by Cerro Gordo County, Iowa. Also a pile of steel posts. The two points of interest are that fence and posts are centrally stored in at the headquarters or a district garage—not out in the fields—and that they are definitely stored up on dry platforms. The fence, in particular, is further protected from weather by the large bulk of the piles, although rolls are so stacked that they are properly ventilated.

As mentioned in a previous article, this county's fence replacement has been very small over the past twenty years, due principally to the unusual care taken of fence. R. E. Robertson is county engineer.

•

Truck-Mounted Crane Rail Aids Street Repair Crew

Some cities still use a lot of sectional concrete or stone curb. Cincinnati is one of these, and a force account crew in the street department rigged up the truck-mounted crane shown herewith for facilitating hauling, unloading and setting these heavy sections. The rail is mounted on a sturdy structural steel swivel post in such a manner that it can be swung in better than a semi-circle. A hoist block is seen being lowered with a curb section, balanced by other sections lying on the far side of the truck bed. This unit is a variation of commercial units now available again.

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Sectional Small Parts Bins for Field Shop

(*See opposite page*)

Some time ago we snapped this photo of the interior of a field shop on a Minnesota airfield. The contractors were Megarry Brothers of that state. Their grading outfit was serviced and repaired in a typical two-stall field shop of ordinary layout but unusual in that it was made up sectionally for trucking and re-erecting from job to job. The sectional design even went down to the parts bins arranged along the side walls. As noted, the bins are built into individual boxes of sufficiently small size so that two men could easily hoist them up into a truck.

★ One way to set curb sections with less hand labor

Extending Culvert Wing Footing Without Sheeting

Lengthening of culvert boxes and consequent extension of wingwalls is a common occurrence these days when so many pavements are being widened. Max J. Zeller, of Columbus, had several such job on a 14-mile widening project on U.S. 40 in Ohio during 1946. The trick was to get new footings concreted and existing footings widened during a dry spell without need of sheeting. Sandbags did the trick in the instance pictured.

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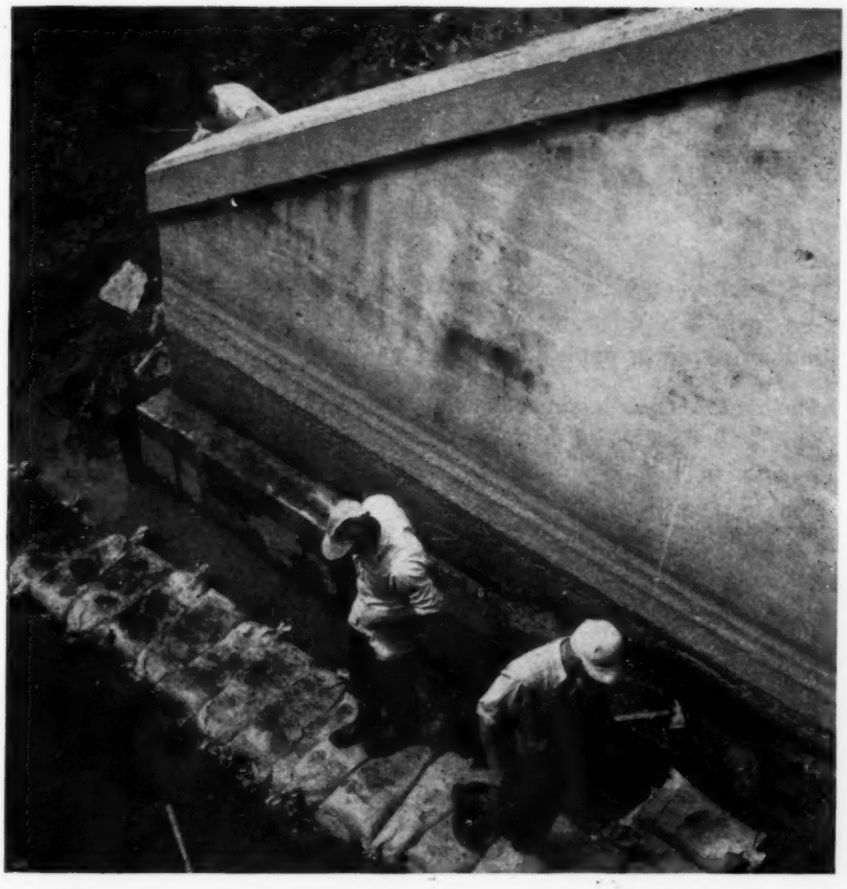
Iowa Right of Way Practice

The following note is taken from Circular No. 11 (February, 1947), of the Highway Research Correlation Service:

W. P. Nichols, right of way engineer, Iowa state highway commission, has prepared an informal memorandum of brief suggestions for preparing right-of-way plats and descriptions. Several items therein are especially worthy of note.

It is indicated that the checking and proof-reading of right-of-way plats and descriptions should be one of the most carefully executed steps in the acquisition of right-of-way. "The best engineering can be completely ruined by failure to give this important step proper consideration. Right-of-way work cannot be checked too often as errors not only affect the records of the state or county, but also the land owners, mortgagees, abstractors, county recorders, and others. Repeated checking and proofreading will eliminate the typographical errors and the inexcusable errors due to carelessness. Even with proper checking we sometimes find right-of-way described in the wrong township, so give this matter the most serious consideration."

Another item concerns the use of figures and language in the description. "Arrangement of words and numbers sometimes can lead to serious error as shown by the following bad example: 'thence south along the east line of said section 26 40 ft.' A typographical or copy error might easily make this road 'section 2 640 ft.' or 'along the east line of said section 2640 ft.' Therefore, write distance and bearing together as follows: thence south 40 ft. along the east line of said Section 26. It is not only necessary to eliminate all possible errors but also to eliminate all *possibility of error.*"



16% More Finished Steel Probable

If the steel industry can operate at top rates during 1947 without interference from strikes, then consumers may have as much as 16% more finished steel than they were shipped in 1941, according to the American Iron and Steel Institute. In 1941, one-tenth of total steel shipments went for U. S. war and national defense purposes, yet shipments for peacetime purposes permitted record production of many durable goods.

•

Tail-Lights Proposed for Pedestrians—A bill has been introduced in the state legislature of Kansas requiring pedestrians to wear tail-lights.

Chrysler Industrial Power Has Wide Acceptance

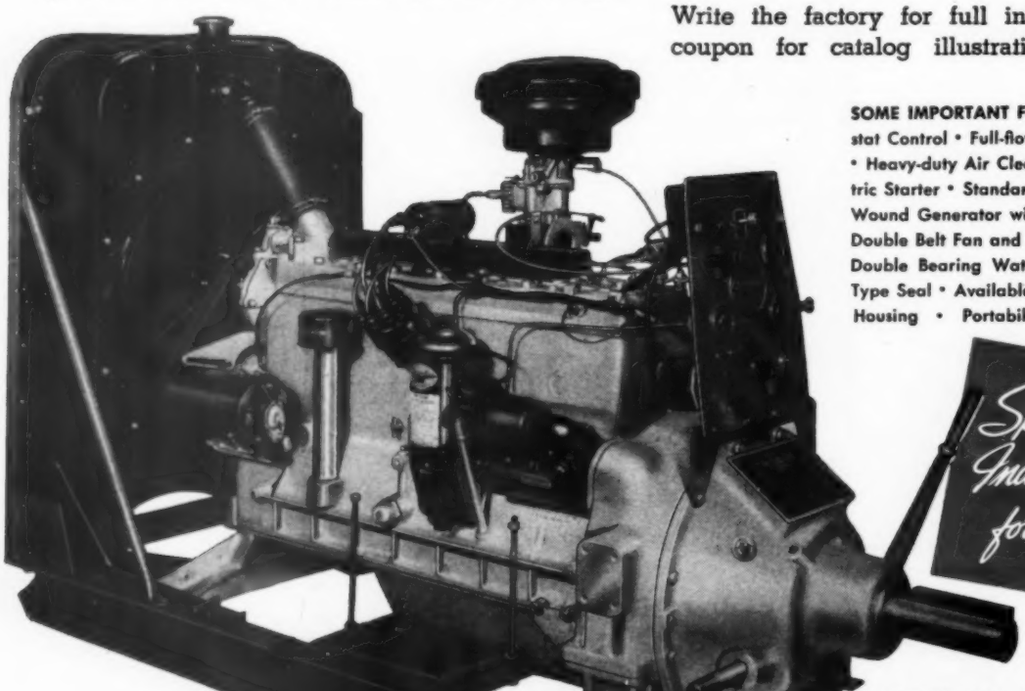
★ ★ ★

DEPENDABLE Chrysler Industrial Engines have gained *wide acceptance* in many types of industrial power application.

The performance record of these engines, over a long period of years, has earned for them a *top position* in the field of industrial power. The design, engineering and manufacturing facilities of the Chrysler organization have been a major force in building this fine record.

A vast parts distribution system, from coast to coast, assures operators constant *earning power* because of maximum work hours.

Write the factory for full information or send coupon for catalog illustrating the full line.



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Texas Reflectorizing Road Signs with Glass Beads

Special equipment speeds application of beads in Fort Worth district sign shop. Several districts using beads purchased originally for center striping. "Easter egg" signs through cities being tried. Notes on Texas sign modernization program and costs

WE dropped around to the district office of the Texas state highway department the other day, mainly to see a glass bead spreader box that we'd been hearing about. We saw the box in use, and a neat device it is. District engineer G. M. Garrett and district maintenance engineer E. J. Willson also told us a bit about the Texas department's state-wide sign refurnishing program, directed by state maintenance engineer G. B. Finley.

More about the program in a minute, but first to explain the department's policy on reflectorizing and to describe the bead box. All rural directional signs on state routes are reflectorized when built or taken in for repainting, and today practically all have this safety feature. Only route markers are reflectorized on urban sections. At the present time rural sections will be reflectorized as paint becomes plentiful.

As is the policy on virtually all highway matters, the twenty-five district engineers in Texas are allowed to exercise considerable judgment in following general design standards. While the department has a complete and up-to-date sign manual, the specifications are so written as to permit a choice of paints and reflector materials. Some districts use reflectorized cloth. Several district engineers on the other hand have decided to make use of a supply of glass beads purchased several years ago for beaded center striping, a practice since abandoned in favor of a non-reflectorized stripe consisting of a bituminous seal coat and chips (ROADS AND STREETS, August, 1944).

Details of Bead Box

The Fort Worth district sign shop employees experimented with bead application, and soon saw the need for a spreader device which would speed up the shop work and save labor. The result is a wooden box which drops a thin layer of beads on a freshly painted or varnished sign surface as the box is pushed along suspended from a pair of guide rails. See accompanying photographs.* Note that it is operated by two men, who lay the freshly painted sign board or shield flat on a bed, pass the bead box slowly across while its bottom slot is open, then close the hopper with a hand lever and tip the board so that excess beads fall into a bin for reclaiming.

One pass is sufficient for small signs. Signs wider than the box need an additional pass to cover all portions. The rate of pass is not important, since only the layer of beads immediately in contact with the varnish will stick.

*Detailed drawings of the design of this bead box are available to anyone specially interested. Inquiry should be directed to George M. Garrett, district engineer, Texas Highway Department, Fort Worth.

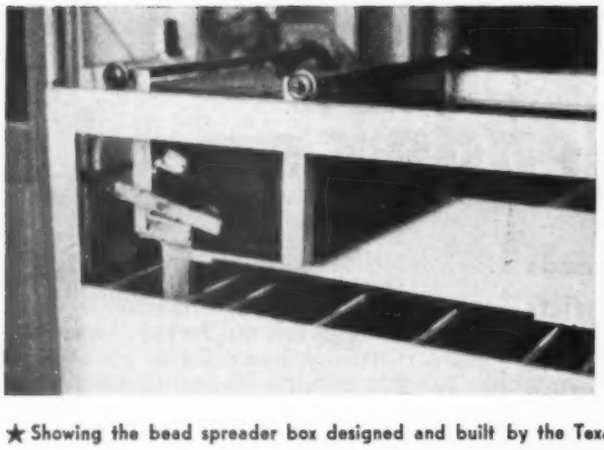
Most of the signs are made with varnish as the glueing medium. The sign background is painted, by hand if large and by spraying if small. Lettering is stenciled or put on with silk, and after drying the sign is then coated with a thin layer of transparent varnish and beads applied. More than the normal amount of stencil work has been recently done due to difficulty in getting silk screen materials.

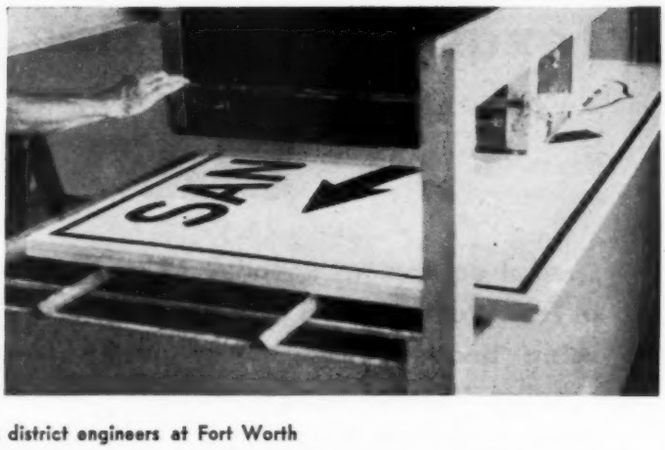
The varnish is furnished to a special specification, but any good grade of varnish will do, in the belief of the Fort Worth district engineers. The main thing is to learn by experience exactly the best thickness of application, in order to embed every bead without having any beads enveloped with excess varnish.

Sometimes the shop runs out of varnish, in which case paint is substituted. In such cases, the beads are applied before lettering, and the letters painted over the beads. Letters have a slight tendency to run when applied over beads, but otherwise there is said to be little difference in appearance and visibility between the two methods.

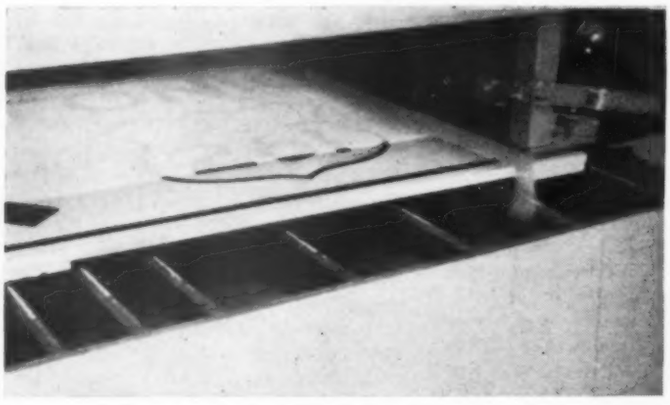
The bead application has averaged .115 lb. of beads per square foot of surface. This is for coarse-grade beads of graduated sizes. The bead manufacturer has recommended use of finer, uniform size beads, but the

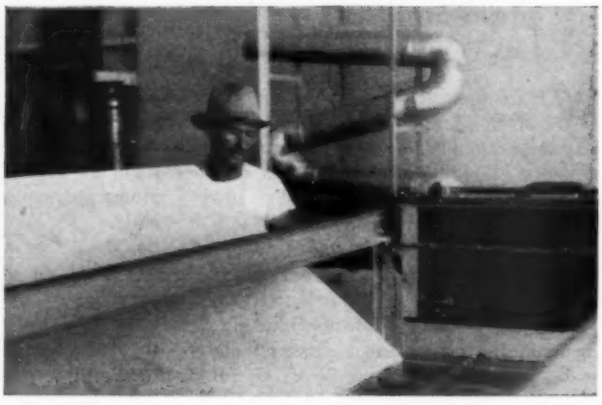
★ One of several methods of mounting groups of signs at intersections, the arrangement depending on number of signs. Note that the word "Texas" has been omitted from U.S. shields to permit larger lettering of the route numbers





★ Showing the bead spreader box designed and built by the Texas district engineers at Fort Worth





★ Another view of beads being dropped from the slot as box passes over, and sign being lifted to allow excess beads to slide into reclaiming bin below

★ Lettering can be applied either before or after coating with bead-base and beads, as pictured here

bead supply on hand is of the other type.

Visibility Tests

The Texas highway department has run tests on the relative visibility of reflectorized signs made with beads and with factory-reflectorized cloth.

While the reflectorized cloth sign was recognizable as U. S. Shield Route Marker about two hundred feet farther than the beaded sign (made as described above), the numerals and arrows were visible ten to twenty-five feet earlier on the beaded sign than the reflectorized cloth. Both types of reflectorized signs are on the whole said to become visible at a satisfactory distance.

No tests have been made that rule out either type of reflectorizing, and on the other hand the tests have served to re-affirm the basic importance of utilizing any acceptable means of reflectorizing to the utmost.

"Easter Egg" Colors

An interesting innovation in Texas sign practice is the adoption of colored signs for important urban routes through several of Texas' larger cities, as an aid in keeping through motorists on their chosen routes. The scheme used, on a somewhat experimental basis, is to adopt a combination of background color and lettering color that is, if possible, uniform for a given arterial route in all cities traversed.

The "Easter Egg" signs, as they have been dubbed, are to be seen in Fort Worth, Dallas and Austin, and may be tried in other cities soon. To

(*Continued on page* 101)

Barber-Greene

The Ditcher that Conquered CORAL ROCK!

Tough abrasive coral rock wasn't considered a good spot for a mechanical ditcher until the B-G Vertical Boom Ditcher first showed how the job could be done. Since that time, miles of trench have been cut in coral rock by B-G Ditchers, from the Florida flat lands to the Pacific's war-won islands. Naturally, with that kind of ability it is the preferred, moderate width, medium depth ditcher for working in everything from cemented gravel to sticky gumbo.

Like all B-G machines, it is engineered by experts to give long-time, cost-reducing service: the self-cleaning "kick-out" digging buckets on the vertical boom operate like a milling machine for sure cutting action: the automatic overload release gives positive protection, automatically resets itself: its short length, low over-all height and sure-footed crawlers give it maximum maneuverability. These are unique features that recommend this B-G Ditcher for tough going. Barber-Greene Company, Aurora, Illinois.

There's no other like it! No other ditcher can equal the efficient "milling action" of the B-G "vertical boom" Ditcher.

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Constant Flow Equipment

LOADERS · PERMANENT CONVEYORS · PORTABLE CONVEYORS · COAL MACHINES · BITUMINOUS PLANTS · FINISHERS · DITCHERS

AMERICAN ROAD BUILDERS' ASSOCIATION

November 1[illegible]

Mr. Charles M. Upham, Engineer-Director
The American Road Builders Association
Washington, D. C.

Dear Mr. Upham:

You ask what I think our program should be to inform the public about roads as a major force in our national welfare. First I believe that:

Every American has an economic stake in a road-United States.

School children and their parents, mail-carriers and salesmen, physicians, surgeons and nurses travel daily over roads and highways. Fruits and vegetables, poultry, livestock and meat, raw materials and manufactured goods, farm products and building materials come to us by highway.

Forty-nine large cities get 100 per cent of their milk by road. They stretch from Boston, Massachusetts, to Sacramento, California. And 54,000 smaller communities have no railroad facility at all. Roads serve them utterly.

Last year, 164,649 doctors drove one-and-a-quarter billion miles to reach their patients. A far greater number of patients drove to hospitals and physicians. If a road is not all-weather, a child may die. Yet still we have 861,000 miles of rural roads which are primitive — roads with no improvements whatever!

Much of the economic structure of this nation — and in normal years, 7,000,000 direct jobs — rest on roads and road transportation. Almost countless services and products go into roads and their maintenance . . go into the economic stream. Prosperity can be helped; depressions can be delayed or prevented. Second I believe that:

Every American has a human stake in a road-United States.

Roads are magic threads to relaxation, vacation, restoration. Roads widen horizens for many, extend cultural opportunity, bring people together. Road-united hemispheres promote world understanding.

These factors in the nation's welfare should, I think, be vividly explained to all the people: to women in the home, women in business; to farmers who ship their produce to market; to doctors, manufacturers, and the parents of rural school children. The message should be dramatized expertly and completely.

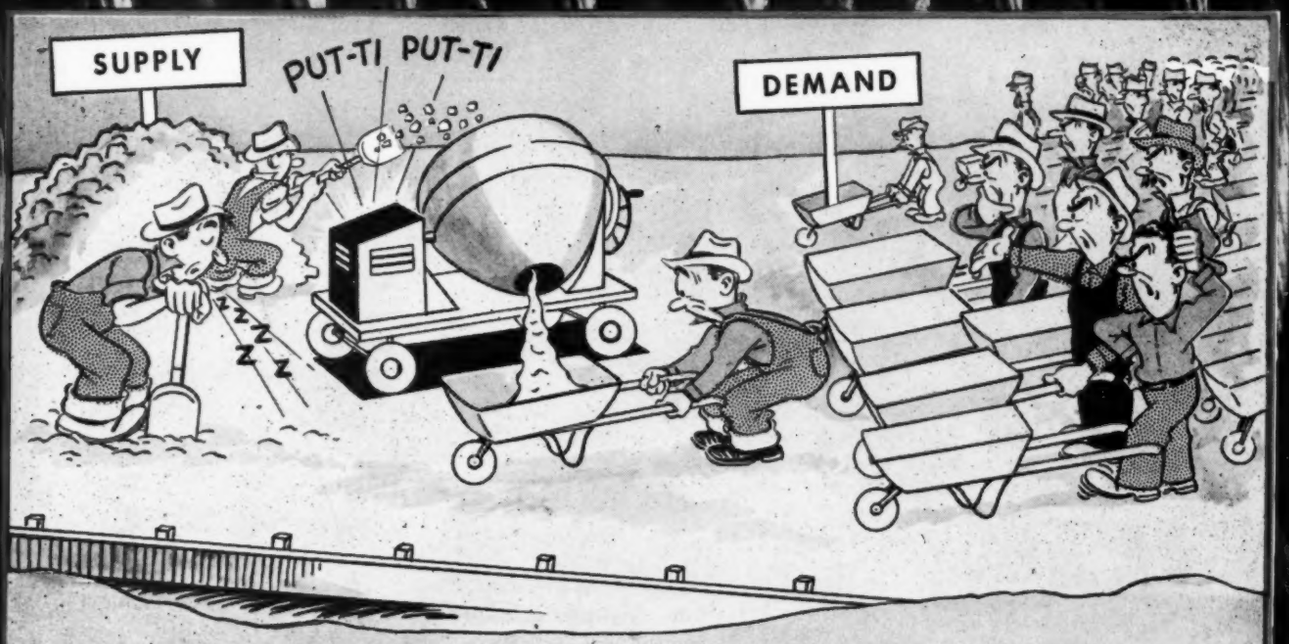
People pay for good roads whether they have them or not. Enough perhaps can be saved — lives and time saved by engineering design, money saved by machine efficiency, road-saved tires, road-saved trucks, faster earth-moving, more efficient transportation — to have our road-cake and eat it too. Enough can be saved in the long run to make it almost costless to build a really road-United States.

Very truly yours,

Roscoe Ellard

Roscoe Ellard, President,
Public Relations Division

"A ROAD-UNITED STATES SHOULD BE VIVIDLY EXPLAINED TO ALL THE PEOPLE. . . . " Says Roscoe Ellard, Associate Dean of the Graduate School of Journalism, Columbia University!



IT'S HIGH TIME TO QUIT "PUT-TI-PUT-TING" AROUND AND GET TO WORK . . . AND HARD THAT IS!

We dislike to bring it up again—but it's no good to run away from the facts. The time and money America has lost since the war through erratic, insufficient, and high cost production would build many miles of roads, streets, railways, waterways and many, many bridges, overpasses, underpasses and airports.

It is these arteries of transportation which have played a tremendous and vital part in making America the most efficient country in the world. Summed up in Professor Roscoe Ellard's letter are basic facts which vividly show that continued expansion and improvement of these arteries are even more important to America's future than was their construction to America's past progress.

Hard work at the job of production and construction built the arteries over which America traveled to the world's highest standards of living. Only when we get hard to work again will all the people be able to journey on to even higher standards of living.

The responsibility rests on every citizen in proportion to the rewards he expects to get. This means that, individually and collectively, the road building industry and profession is called upon to make the greatest contribution in work and experience and in educating a substantial portion of 140 million citizens on the value of the public's stake in a Road-United States.

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THESE JOB-PROVED EUCLID features BRING HAULING COSTS DOWN

GREAT BODY AND FRAME STRENGTH Strong, rigid frame and sturdy body are designed and built to withstand the impact and wear of loading heavy excavation with large shovels and draglines, and traveling over rough haul roads with 15-ton loads.

POWERFUL AND EFFICIENT DRIVE AXLE Double-reduction, planetary type drive axle attains tremendous pulling power. Full rear axle load is carried on heavy-duty tapered roller bearings. Final reduction is taken at each wheel.

DEPENDABLE PERFORMANCE . . . Records from all types of mining and construction jobs are proof of the efficiency and long life achieved by proved design and painstaking production of every part.

Complete specifications and literature on all Euclid earth-moving equipment are available from your Euclid distributor or by writing direct.

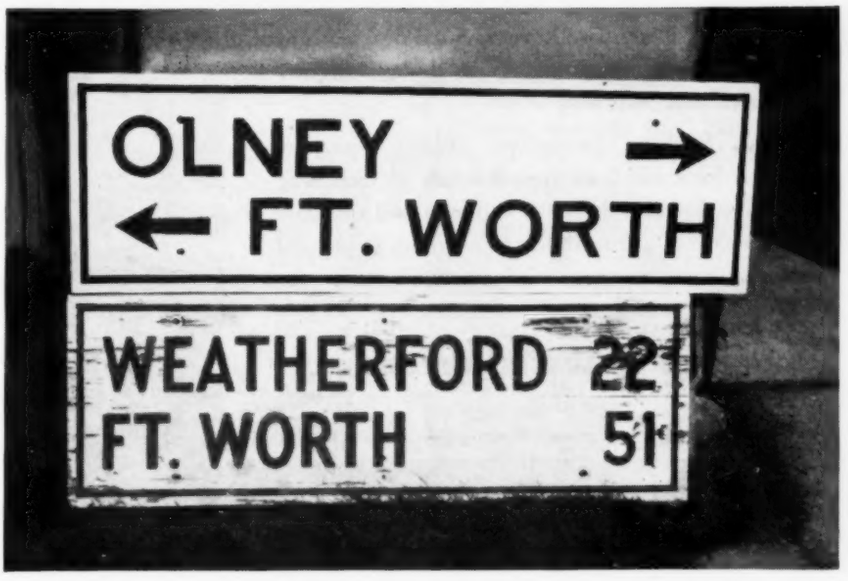
Built for a wide range of off-the-highway heavy-duty hauling . . . 15-ton capacity . . . 9.7 cu. yds. struck measure . . . loaded top speed 22 m.p.h. . . . powered by 150 to 200 h.p. Diesel engines.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

★ Arrow points to an "Easter Egg" or brightly colored sign, being tried experimentally to mark important urban sections in Texas

★ Expanded or extra wide lettering is favored by the Texas highway department. An example of redesign



(*Continued from page* 96)

give a specific example of color schemes, urban markers on three arterials through Fort Worth are now painted respectively maroon with white letters, Federal yellow with black letters, and royal blue with white letters. Some controversy has been expressed over the use of a yellow background, since yellow is traditionally associated with warning signs.

Experiments with color combinations show that the color effect, for sign differentiation to the eye of the motorist, must be obtained through a colored background, and that any color of lettering dark enough to be effective on a white background might as well be black, since it will look that way. Backgrounds for white letters must be of a heavy color. Shades of green darker than willow green, for example, are necessary with white lettering. Color combinations proposed are submitted to the state maintenance engineer for coordination with those of other cities.

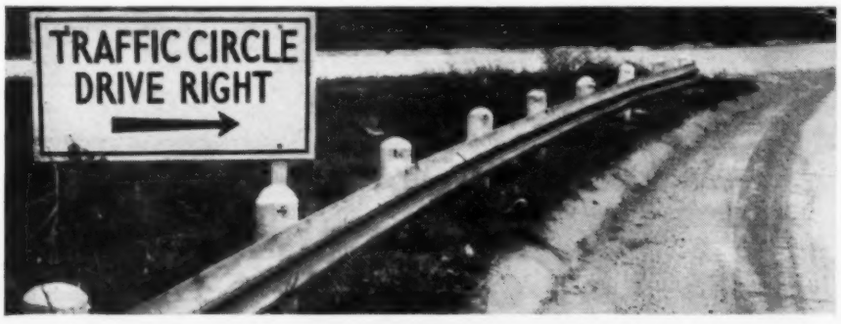
Other Sign Developments

Another innovation in Texas is the use of expanded or broad lettering wherever feasible in replacing signs. It is felt that condensed lettering, while reducing sign size and cost, is not easily read. Even normally wide lettering is not considered as readable as some signs need to be in these days of high speed.

Also as an aid to readability, the department is gradually adopting the new standard rounded letters in place of the old box-shaped letters. But the changeover has been slowed by the inability to replace stencils quickly.

Sign Costs High

Sign costs are a matter of serious concern today in Texas, as elsewhere. An illustration of the high cost of properly signing a modern road is shown in the case of a 1.92-mile new construction project entering the small community of Stevensville. The roadway is two-lane, and three intersections are involved. The signs cost $670. This isn't an unusual figure, either. Such a cost is high in comparison with the normal $300 per mile average cost of surface maintenance on similar roads.



★ Reflectorizing beads were applied to yellow painted curbs and guard rail here in inner side of reverse curve entering a suburban traffic circle

Reflectorized Curb Surface

Several attempts to reflectorize areas of concrete curb have been made in the Fort Worth highway district. One instance is along the inner curb of a new traffic circle near the outskirts of Fort Worth. The yellow painted curb and also the inner guard rail was beaded in an effort to warn fast drivers that the road here does not go straight through —an erroneous impression created by the lack of a shrub barrier to hide lights of vehicles coming toward the circle from the opposite direction. A near-serious bus accident led to the experimental treatment. In the first months since applying the paint and the beads, no mishap has been reported or evidenced by paint scratches. Beads were applied successfully by blowing them into the fresh paint with compressed air, using a hand-held air nozzle in conjunction with a "fruit jar" device from which a fine stream of beads dropped by gravity.

ANY WAY YOU FIGURE IT . . .

BUCKEYE TRENCHERS

GIVE YOU LOWER COSTS AND GREATER PROFIT

When you compare trenching costs . . . and include everything—initial and operating costs, maintenance, and average number of feet trenched per hour, shift or day, you'll find a Buckeye's the best investment you can make.

There's a good reason for this. Buckeye engineers discovered long ago that slow speed operation and down-time kill profits in trenching . . . that initial cost is relatively unimportant. Buckeye Trenchers are therefore designed for greatest maneuverability, to give you fast, steady operation . . . are ruggedly built to stand up year after year in trenching everything short of solid rock. Such design and construction standards are maintained even though slightly higher initial costs may result.

The Buckeye boom-type utility Trenchers shown here are built for all kinds of trenching work, where the ability to undercut and cut close is as essential as the ability to maintain grade and curve. For complete information write for Trencher Catalog.

BUCKEYE TRACTION DITCHER CO.
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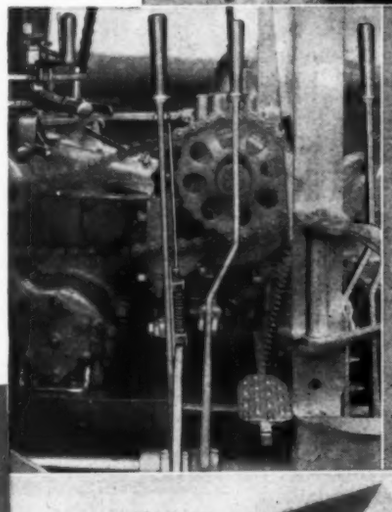

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LETTERS AND COMMENTS

Contractor Comments on Union Question

To the Editor:

Your letter of January 3, 1947, came to my desk for acknowledgment and comments. Attached to your letter was a reprint of page 79 of November issue of ROADS AND STREETS, and copy of a letter of comment from A. F. Garlinghouse, of Garlinghouse Brothers, Los Angeles.

We all know that many irksome demands have been made by Unions in their dealings with Employers, but if we stop to think we also know that many times Employers have been unfair in their dealings with Unions. It is my opinion that the best way for Employers to counteract the so-called "featherbedding" of the few Union officials and Union members who resort to such practices, is to intelligently bargain, honestly and fairly, with Union representatives to bring about better Labor-Management understandings.

When we enter into a Collective Bargaining Agreement, we should feel the responsibility of continuing to bargain throughout the life of the Contract. Each day demands may be made by the Unions, and each day Employers' representatives may treat some employee unfairly, and we, as Employers, must ever be alert to make sure that we as Employers live up not only to the letter but to the intent of our Collective Bargaining Agreement. If the Unions demand conditions which we consider unfair, we should try to convince them of their unfairness, and honestly attempt to work out all controversial issues.

I do not believe the Fulton Lewises or the Peglers accomplish as much as some people think. We will never bring about good Labor-Management relations while either side are throwing rocks. If as Employers we are fair, open and above board in all our deals, we will soon beget the confidence of not only the Union officials but the membership as well. And when we establish ourselves as being fair and impartial in working out controversial problems, we will find the Union officials and the Union membership looking more and more to us for leadership.

I believe the Unions in this country have accomplished a lot, they certainly are far from perfect but how many Employers can we name who are always fair with their employees? Let's all get together, and work for the common good of both the Union membership and the Employers—and the so-called Labor-Management problems will be solved.

—W. J. Rohan, Vice-President-Gen'l. Mgr., Winston Bros. Company, Contractors and Engineers, Minneapolis, Minn.

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Answering Editorial "Why a Professional Engineer?"

To the Editor:

I am writing you as a long time reader of your highly esteemed publication, "ROADS AND STREETS," and also as Chairman of the Minnesota State Board of Registration for Engineers, Architects and Land Surveyors. I have just finished reading the editorial by H. K. Glidden entitled "Why a Professional Engineer Classification" which appears on pages 66 and 67 of the January, 1947, issue. If Mr. Glidden is serious in his statements in this editorial, which is difficult to believe, he indicates a surprising lack of knowledge as to the present status of registration of engineers and as to what has been accomplished during recent years. I have served on our Board for a number of years, and through work on committees of the National Council of State Boards of Engineering Examiners, am quite familiar with the standards of a number of such state boards.

To clarify Mr. Glidden's view as to the term "professional engineer" it may be stated that this term was originally adopted to distinguish the engineer with technical training and experience from locomotive, operating and other practical engineers. Many states do have registration in the respective engineering classifications of practice. In favor of the single term of "professional engineer" is the element of simplicity of usage, which makes it comparable to the terms lawyer, doctor and dentist as used in other professions. The boards using the single term have, of course, in their records the full classification of each candidate in his specific field. The examinations, whether written or oral, have sufficient choice of questions, or have the questions arranged in classifications so that no person who is qualified need fear that it will be necessary for him to bone up on studies outside of his own field to pass such an examination.

Registration Policies Approved

With registration laws now in all of the states, except Montana and the District of Columbia, and all of the territories except the Philippines, there is very little question but that registration as administered throughout the country has the whole-hearted approval of the rank and file of professionally minded engineers. It is difficult to see where the registration of engineers is "subject to a lot of controversy." Some 100,000 engineers are now registered in the United States and its territories. With approximately 10,000 engineers being registered annually, it is apparent that all of the "outs" do not have as hard a time to get "in" as Mr. Glidden would have his readers believe. While there may be occasional delays in reciprocal registration on account of different requirements in different states, it is very clear that the matter of registration has gone far beyond the controversial stage. Each state has the right to set up its own qualifications for those who practice engineering in the state, in the same manner as is done for other professions or callings. Such regulation or licensing is necessarily based upon promoting the public welfare and safeguarding life, health and property, rather than the establishing of a particular classification to fit the personal whim of the applicant. Because several of the states have more rigid requirements than others, is no reason why the present registration practice, which has been built up over the past thirty years by laborious effort on the part of sincere groups of engineers, should be blanketed into such a general condemnation as Mr. Glidden indulges in. His reference to unfair and discriminating practice, the "rude awakening" (of the man who had undoubtedly been professionally asleep since his graduation), and "a drag

with the board," can hardly go unchallenged.

Find Tests Fair

Many of us who have been engaged for many years in the humdrum process of preparing plans and specifications and supervising the construction of both large and small projects, read with dismay the statement: "We will venture the opinion that short of sheer genius there is no such creature as a professional engineer." Having considered ourselves professional engineers all these years we are chagrined to learn that only supermen may hope to assume this title. It has been my experience that any one, young or old, who has taken his profession at all seriously has little trouble in passing examinations whether they be written or oral. In fact many of the boards have felt that the only means of freeing themselves of charges of favoritism, or as Mr. Glidden puts it, a "drag with the board," is to require universal written examinations.

Why should not the engineering profession have at least equal requirements for entrance with other professions? The architects have long had rigid requirements of written examinations, except for those applicants with long established practice. Lawyers whether they be young or old must take a written bar examination. In most states candidates for the degree of doctor of medicine must take a written examination both in the basic sciences and in professional practice. The basic science examination may be taken by the medical candidate upon finishing the four-year pre-medic course on the same principle as our Engineer in Training examination is now given upon completion of the engineering course.

Model Registration Law

To give you and Mr. Glidden an idea of the endorsement given the present administration of registration by the engineering profession at large, I refer you to the July, 1946, edition of the Model Law, together with the 1947 information pamphlet issue of the National Bureau of Engineering Registration. The Model Law for registration or licensing of engineers embraces more than a quarter of a century. It has been revised from time to time to meet changing conditions. A meeting for revision was held in August, 1945, and as a result of this meeting the July, 1946, edition was issued. The present Model Law was approved and endorsed by representatives of the thirteen leading engineering societies of national scope. Your own state of Illinois was ably represented among the delegates from these societies. The Model Law in past years has formed the basis of registration laws in many of the states and at the present time is frequently used as a model for amendments and revisions of existing laws. Your attention is called to the general requirements for registration on page 16 of the Model Law. Applicants are classified in three categories.

(a) Graduates with four additional years of experience of a character satisfactory to the board, and the passage of an oral and written examination, or both, as the board may determine.

(b) A specific record of eight years or more of experience in engineering work of a character satisfactory to the board, and passing a written or written and oral examination.

(c) Engineers of long established practice.

Grand Profession

I am in agreement with Mr. Glidden that engineering is a grand profession and feel also that we must keep it so. The adoption of three grades of practicing engineers as suggested, would be entirely impracticable of accomplishment. What board is there that would attempt to pick out a "full" engineer and set up a separate qualification for such supermen? There is no more reason for setting up such a distinction in engineering than in law or medicine. Either the applicant is qualified to practice engineering under the law or is not. Several of the founder societies are now considering the abolishing of the distinction between associate and member and are favorably considering the use of the two designations, junior and member, with qualifications of education and experience for members being approximately the same as that for registration.

The situation of ex-army engineers and seabees was referred to in the editorial. Several states, including Minnesota, have definite provisions in their laws requiring that veterans of both world wars shall be given credit for such experience or education as may have been gained in the armed services, providing same meets the standards fixed by the board. All boards undoubtedly do give this credit without specific provision in the law.

In view of the widespread interest in engineering registration matters, I have taken the liberty of going to this length to comment on the editorial, in order that your readers may have the other side of the question.

—George M. Shepard, Chief Engineer, Department of Public Works, St. Paul, Minn.

•

Fabricated Structural Steel Bookings—The total estimated bookings of fabricated structural steel for the twelve months of 1946, according to reports received by the American Institute of Steel Construction, amounted to 1,726,057 tons or an increase of 14% over the average of 1,509,496 tons booked for the same period in the five prewar years 1936 to 1940.

•

British Motor Vehicle Registrations Increase—Motor vehicle registrations in Great Britain stood recently at 2,929,000, an increase of over 50% since May, 1945, when the number was 1,925,000.

Lest We Forget

Highway programs the country over must have more funds than are in sight from existing sources of revenue. Every individual engaged in highway engineering or contracting owes it to his state and community to aid in selling the public and his legislators on sound, necessary action. Due to inflation, the staggering accumulation of highway need, and the constant up-grading of highway designs, larger gas taxes are an imperative need in many states.

But—highway programs must always be considered on their own, separate from general "public works" where pork barrel methods are likely to be involved. Highways are a self-liquidating, pay-as-you-go part of a dynamic modern world.

And—as a corollary highway programs must never be sold as "shelves of plans" to be held back for employment aid in bad times.

Anyone who fails to perceive the economic loss resulting from withholding normal highway work, even a short while, should be told of the cost of maintaining our war-worn and out-grown highway plant. The 750 millions of inflated dollars spent only began to put our roads in shape, and the need for spending that sum denotes a condition whose real cost in intangible terms cannot be calculated.

Don't Get Burnt

How to Use Electricity and Electrical Equipment More Safely

Our thanks to Liberty Mutual Insurance Co. for this information

EITHER for lighting or as a source of power, electricity and electrical equipment are found on almost every construction job and in equipment repair shops.

There are a few important things that everyone using or working in the vicinity of electrical equipment should understand for their own protection and the protection of others.

Electricity can be handled and used with the utmost safety and this article is intended to outline a few of the more simple facts regarding electricity that should be known to all men working with or near it.

110 Volts Dangerous

Every year over 700 persons are electrocuted in accidents involving voltages of less than 750 volts. Some of these fatalities and many shocks occur on 110 volts.

Unfortunately, it is not generally appreciated that contact with so-called "low voltage" circuits (below 750 volts) can produce fatal electric shock. This general opinion results from the fact that persons repeatedly receive accidental shocks that are not fatal. They draw the false conclusion that, since they themselves have been shocked without being killed, no one else could receive a shock that could prove fatal.

Their mistake is that voltage itself is not the measure of dosage of electricity through the body which determines the severity of the shock.

The factors that determine dosage are these three:

1. The actual quantity of current flowing through the body.
2. The path of the current through the body.
3. The length of time the current flows through the body.

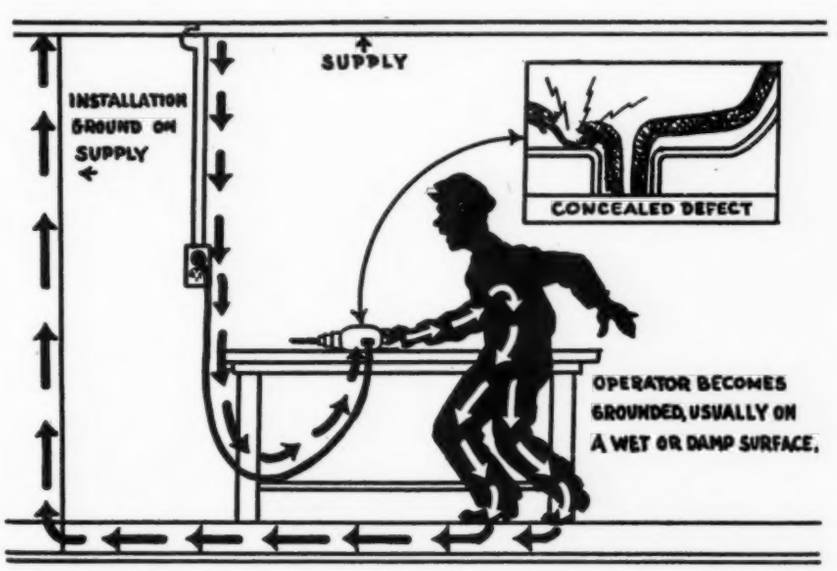
These factors are highly variable even where the voltage itself is constant.

The path of the current through the body evidently depends upon what points of contact are made. Shocks are usually received through either one of the two hands and out both of the feet to ground. The time of contact is of vital importance and depends on whether a man gets hold of a charged part and cannot immediately let go of it because the current causes a severe muscular spasm beyond his control.

The most important variable is the current itself. The current (or amperage) is not entirely dependent on the voltage but depends also on the resistance of the shock circuit through the body including both body contacts.

The body resistance can be easily measured, and varies widely from 100,000 ohms down to 1,000 ohms or less, depending mainly on the contact surfaces. These may be either small or large areas; either dry skin or wet; either loose contact or tight. Under certain circumstances only a fraction of an ampere is required to kill.

Applied to these three factors of



★ Illustration 1

electrical shock, Ohm's Law states that:

$$\text{Current Through Body} = \frac{\text{Voltage Applied to Body}}{\text{Resistance of Body and Contacts}}$$

Where the body is well grounded through water or dampness, the body resistance is lowered and, therefore, the danger of a serious shock current is great.

Source of Shock and Importance of Protective Grounding

A closed electric circuit is required for the passage of current. By simultaneous contact with a ground and with a live wire or an electrically charged part, a worker can become part of a closed electric circuit.

The following diagram illustrates a concealed defect in an insulated wire inside a tool which charges the entire tool. With no protective grounding, the current flows from the handle of the tool through the man to the ground. This is a typical situation where a fatal shock may be obtained. See Illustration 1.

The ground to which the current flows from the body may be any piece of plumbing or piping, the structural steel of a building, a wet floor or the earth itself. The presence of moisture at either of the contacts, damp ground or floors, sweaty hands, etc., makes an easier path for the flow of electric current.

★ Illustration 2

Contact with Live Wire

Loose connections at plugs and receptacles, worn insulation or incorrect wiring are responsible for most human contacts with current carrying wire. The setting up of a regular inspection and maintenance system to uncover and correct such defects is essential for the safe use of electricity.

Extension Cords: The maintenance, use and protection of an electrical extension cord is important. Grease and oil cause rapid deterioration of rubber insulation. Kinks and sharp bends break down the structure of certain insulating materials. Cords should be carried overhead instead of laid along the ground or floor whenever possible. Where this cannot be avoided, cord should be protected by planks.

Temporary Wiring: Temporary wiring for job lighting should be carried above the ground or floor level to protect the wire from moisture, damage to insulation and contact with workers. Brass shell sockets have been responsible for numerous electric shocks. Non-conducting rubber or composition sockets give a maximum of protection and can take a lot of abuse. See Illustration 2.

Dead Metal Parts of Stationary Motors

The insulation on current carrying parts of electric motors may fail unexpectedly, causing a charge on the enclosing or dead metal parts. A worker touching the charged outer casing of an electric motor may receive a fatal electric shock. To prevent these exposed surfaces from becoming shock producing they should be effectively grounded. An effective protective ground can be installed by attaching one end of the ground wire to the outer casing of the electric motor and the other end to a water pipe.

Portable Tools

As in the case of the stationary electric motor, the insulation on the current carrying parts of portable tools may fail unexpectedly, causing the outer casing of the tool to become charged. As portable tools are operated by hand, a charged casing becomes very unsafe to handle. The flexible cord attached to portable electric tools is usually equipped with an additional wire for grounding purposes. One end of the ground wire is connected to the outer frame of the tool and the other end, which extends

★ Electric drill being used in field repairs—Codell Construction Co., on mountain road job in Kentucky

Downtime Slashed—
Production Up—

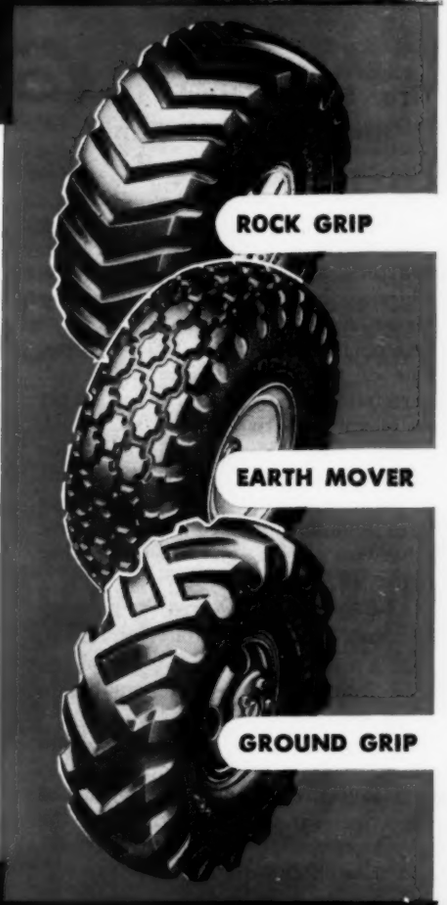
FIRESTONE TIRES and PROJECT SERVICE

CONTRACTORS on widely varied projects in many sections of the country are now using a new combination of off-the-highway tires and on-the-project service which is multiplying production schedules by slashing downtime.

This new Firestone service is basic and simple. Off-the-highway tires, specifically built for that particular type of operation, are coupled with the sound technical knowledge and experience of Firestone tire engineers who, regardless of the size of the project, personally inspect the operation under which the tires are being used. Their recommendations are helping many contractors secure the maximum hours of operation from their equipment and practically eliminate downtime due to tire failure.

Firestone tires and project service will help you raise your production schedules. For further details see your nearest Firestone Dealer or Firestone Store.

Listen to the Voice of Firestone every Monday evening over NBC



Copyright, 1947, The Firestone Tire & Rubber Co.

Firestone OFF-THE-HIGHWAY TIRES

★ Illustration 3

from the plug, should be connected to a water pipe. With such protection, if the outer tool case becomes charged, this situation may be detected by a blowing out of a circuit fuse. The source of all blown fuses should, therefore, be carefully traced and the cause corrected at once. See Illustration 3.

Fire Prevention

Electrical failures cause numerous fires. The maintenance of insulation and the proper hook-up of all wiring with insulators protects against the loss of construction materials by fire. To protect against overloading the electrical system, working fuses should be installed in the system. Short circuiting a fuse with a "penny" to prevent a blow due to an overload sacrifices this protection and should be outlawed.

Maintenance

The most important method for giving all workers protection against accidental electric shock on the construction job is to have a continuous and thorough system for the maintenance of all electrical equipment and fixtures.

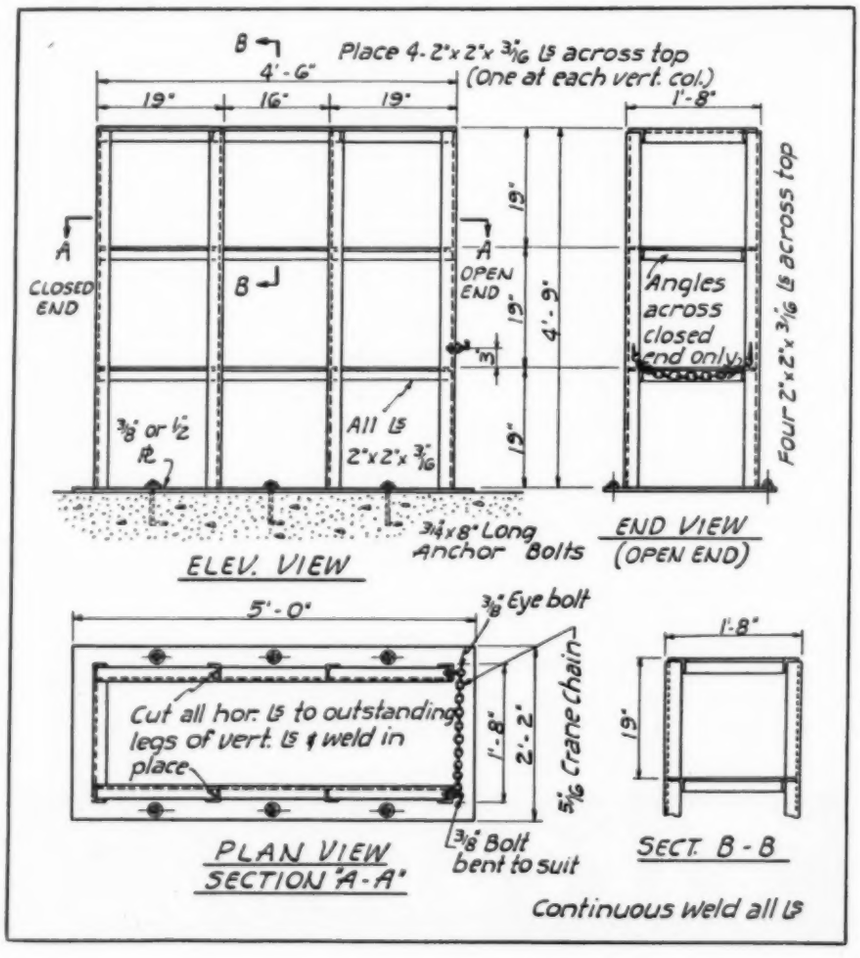
★ Electric grinder—one of the handy shop tools seen at headquarters of J. D. Armstrong, contractor, of Ames, Iowa

Tire Safety Rack Recommended by National Safety Council

The Construction Section of the National Safety Council, with headquarters at 20 N. Wacker Drive, Chicago, has issued valuable Construction Detail Sheets to its contractor members from time to time. One of these, reproduced here with permission, shows how to construct an inexpensive tire safety rack. Such a rack is highly recommended for shop employees who have to mount and demount heavy truck and scraper tires and who run considerable risk otherwise from rim locking ring flying off, etc.

Step-by-step procedure for using the rack is given as follows:

1. After tire has been mounted on wheel, apply locking ring and inflate tire to pressure of 15 lb. only.
2. Pound locking ring firmly into place, using rubber mallet.
3. Roll tire and wheel into end of the tire safety rack. Center the wheel on the pipe framework.
4. Fasten chain at end of frame.
5. Inflate tire to full pressure by working on side away from locking rim.
6. Remove tire only after full pressure has been applied.



Daily Inspection of Vehicles Urged in New Jersey

Highway department maintenance equipment still handicapped by parts shortage; rigid conservation asked by Superintendent Frank Young

The following appeal for extraordinary care of all motor equipment has been issued by Frank C. Young, Superintendent of Plant and Equipment, N. J. Highway Department.

TO ALL OPERATORS:

In order to prevent unnecessary failures in the operation of all department equipment, I cannot urge too strongly upon all operators of cars, trucks, and equipment the preventive maintenance that must be maintained at this time due to the serious shortage and our inability to secure batteries, anti-freeze, spare parts, tires, etc. Every operator must hold himself responsible for checking the following points daily:

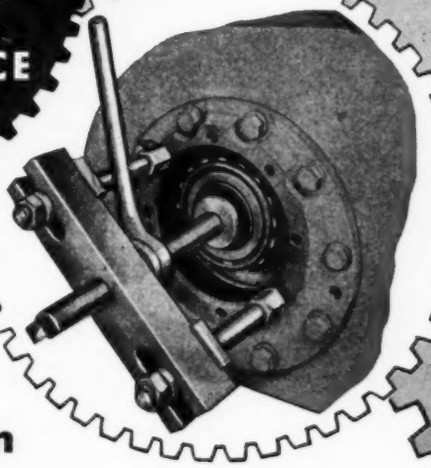
1. Check tire inflation and inspect tires for cuts, damage or signs that wheels are out of line or balance.
2. Check radiator for proper amount of water or anti-freeze and fill as necessary.
3. Check oil level in crank case, fill as necessary.
4. Check the following items for correct operation: windshield wiper, horn, lights, brakes, generator charging rate, engine oil pressure, engine temperature, and truck and car controls (steering, etc.).
5. At the end of the day's work or before, if necessary, report to the nearest garage or inspector any mechanical difficulties or defects which may have developed and should be corrected before further use.
6. Be sure the car or truck is parked or stored properly. All vehicles must be locked when parked.
7. Batteries cannot be replaced. Each week you must check the water level in each cell of the battery and see that the plates are covered at all times. Any battery failures will result in loss of the use of vehicle.

The above minor inspections will aid in uncovering trouble while the repair job and repair costs are in the small stages. Neglect is always costly in automotive maintenance.

Preventing failures begins with and largely depends upon the above inspections which are to be carried out by all drivers as well as the mechanics.

OTC MAINTENANCE TOOLS

OTC PUSH-PULLER removing rear wheel spindle on the Diesel No. 12 Motor Grader by pushing it through bearing. Savings in costly parts, labor and "lay-up" time on jobs soon pay for OTC TOOLS.



Save

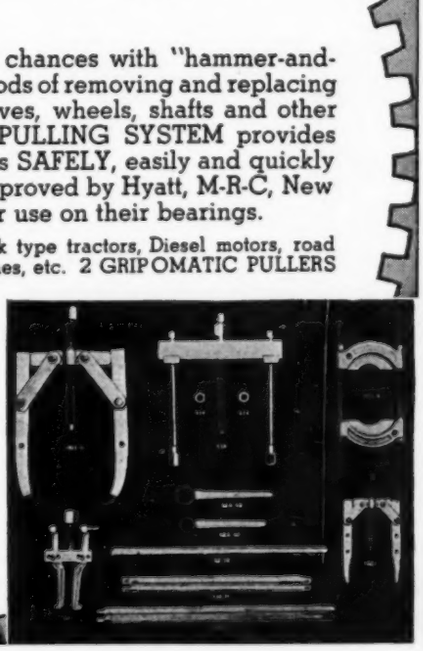
CRITICAL PARTS from DAMAGE

Why let your mechanics take chances with "hammer-and-hope" or "poke-and-pry" methods of removing and replacing bearings, gears, sleeves, sheaves, wheels, shafts and other close-fitting parts? The OTC PULLING SYSTEM provides the proper tools to do these jobs SAFELY, easily and quickly —in the shop or on the job. Approved by Hyatt, M-R-C, New Departure, SKF and Timken for use on their bearings.

No. PE-15 Maintenance Set for track type tractors, Diesel motors, road maintainers, power shovels, drag lines, etc. 2 GRIPOMATIC PULLERS (20 and 9-ton capacities), PUSH-PULLER with extra 22¼" and 16½" legs, Pulling Attachments, Heavy Duty BOX WRENCHES and 24" Tubular Handle.

Write for OTC Maintenance Bulletin showing time-saving OTC uses.

OWATONNA TOOL CO.
319 CEDAR ST., OWATONNA, MINN.



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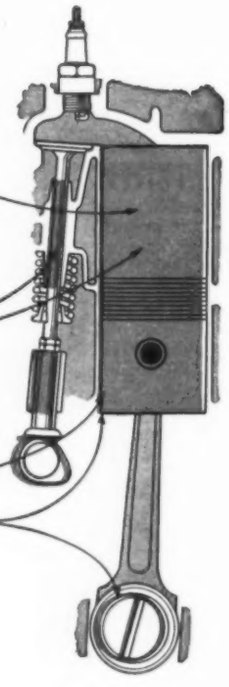
STANDARD ENGINEERS NOTEBOOK

① Adhering agent in RPM Compounded Motor Oil keeps oil film on all parts after engine stops, even on cylinder walls.

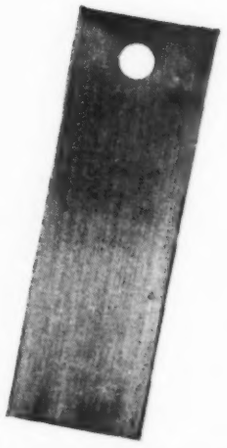
② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

③ No rust is formed to scrape off when engine starts, and cause excessive wear.

④ Constant lubricant film provides adequate and instant lubrication when engine starts.



This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.



RPM COMPOUNDED MOTOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

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For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Colo.; Standard Oil Company of Texas, El Paso, Texas.

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

New Construction Equipment and Materials

1.

New Equipment on Scoopmobile

Power steering and an enclosed cab are new, optional equipment on the standard model scoopmobile of Mixermobile Manufacturers, Portland, Ore. The scoopmobile is a tricycle type materials handling machine. The new power steering unit is the Vickers

Scoopmobile With Enclosed Cab

hydraulic system. Another improvement, added solely for the comfort and protection of the operator, is the enclosed cab, featuring deluxe, full size upholstered seat, windshield wiper, and large safety plate windshield. Both sides of the new cab have doors that may be latched open in warmer weather. Visibility has not been impaired.

2.

New Electrodes

A complete line of stainless steel electrodes in a full range of grades and diameters has been announced by Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y. All Airco stainless steel electrodes are furnished with a heavy extruded lime type coating for D.C. application. In addition all but the straight chrome analyses are obtainable with a lime-titania type coating which is usable on A.C. or D.C. The slag produced by either of these coatings is easily removed.

3.

New Earth Boring Tool

A new horizontal earth-boring tool, light enough to be operated by one man, has been announced by the Hydrauger Corporation, Ltd., San Francisco, Calif. Expressly developed for running in pipe leads, it is reported to be consistently straight-boring for

Model LHH-2 Earth Boring Tool

underground distances up to 50 ft. Power is provided by a 3.2 H.P. motor operated by 90 lb. of air pressure. The pilot bit hole of 2-in. diameter can be opened up by reaming to 3½ and 4½ in. For added handling ease, boring bar sections are only 2 ft. in length and weigh but 5 lbs. each. The new development, Model LHH-2, joins a family of larger Hydraugers.

Mail Inserted Card

For data on equipment described on these pages. See also inquiry blank on page 132.

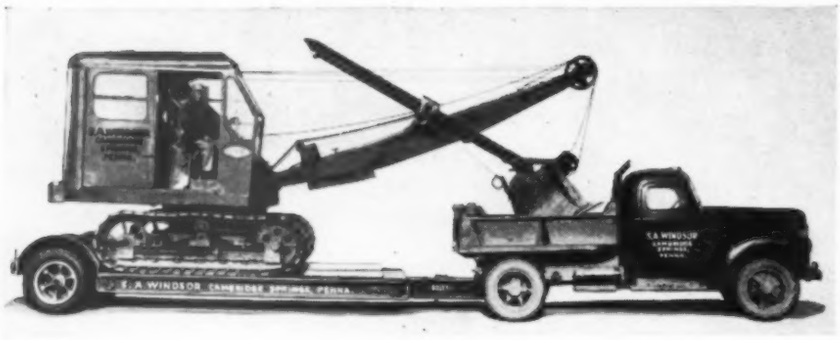
4.

New Spreader

A new highway spreader added to the line of Highway Equipment Co., Inc., Cedar Rapids, Ia., has many uses other than ice control work. The new unit can be used for dust control with calcium chloride in summer, and for applying seal coats on oil. By removing the distributor disc, the new model may also be used for hauling different types of material including crushed rock. It also can be used for hauling and spreading chips and small rock for shoulder maintenance. On this new highway Model "E" spreader, the distributor disc is mounted low enough to the highway to cast the material *low*, eliminating interference with traffic. Material is cast ahead of rear wheels of truck providing traction for truck. Spread may be controlled to cover full width of either 2 or 4-lane highways in one operation. Thickness and width of spread are easily controlled from the driver's seat. The large hopper can be filled with ma-

Highway Model "E" Spreader

terial in advance and held in readiness for emergencies. Built in four lengths to mount on any truck chassis, the Highway Model "E" is driven by power take-off from truck transmission. Drive gears operate in oil and are protected from dust and weather.



Tagalong Frontloader Trailer

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This new H & B traveling plant does the complete mixing and paving job. Write for Bulletin MP-47.

● This Hetherington & Berner portable asphalt plant, recently installed for the West Virginia Black Rock Co., of Charleston, W. Va., has averaged better than 74 tons per hour. This is a PA-20 plant, with all-electric drive wired complete at the H & B factory.

These PA plants are easily portable by truck and are designed especially for the contractor who moves frequently, and who must be able to get efficient production on small as well as large jobs.

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Builders of Portable and Stationary Asphalt Plants of All Types and Capacities

Hetherington & Berner

5.

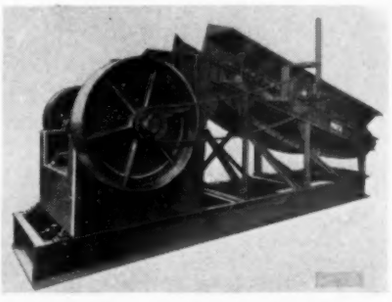
New Trailer

A new trailer especially designed to haul small and medium loads and be hauled by a dummy truck has been placed on the market by Rogers Brothers Corporation, Albion, Penn. The trailer is available in 10, 15 and 20-ton capacity sizes. Equipment is loaded from the front—the dump body lowered to relax cable and engage sheave—then elevated to raise the drawbar and insert towing tongue.

6.

New Apron Feeder

An apron feeder built around a unit assembly without sideboards is now being offered by Pioneer Engineering Works, Minneapolis, Minn. The feeder also can be furnished either with vertical or with flared sideboards, thus making three models available. Each of these models can be furnished with any one of three drives: for gear motor, for conveyor drive, or for drive from the crusher. This provides nine combinations of the feeder, which can

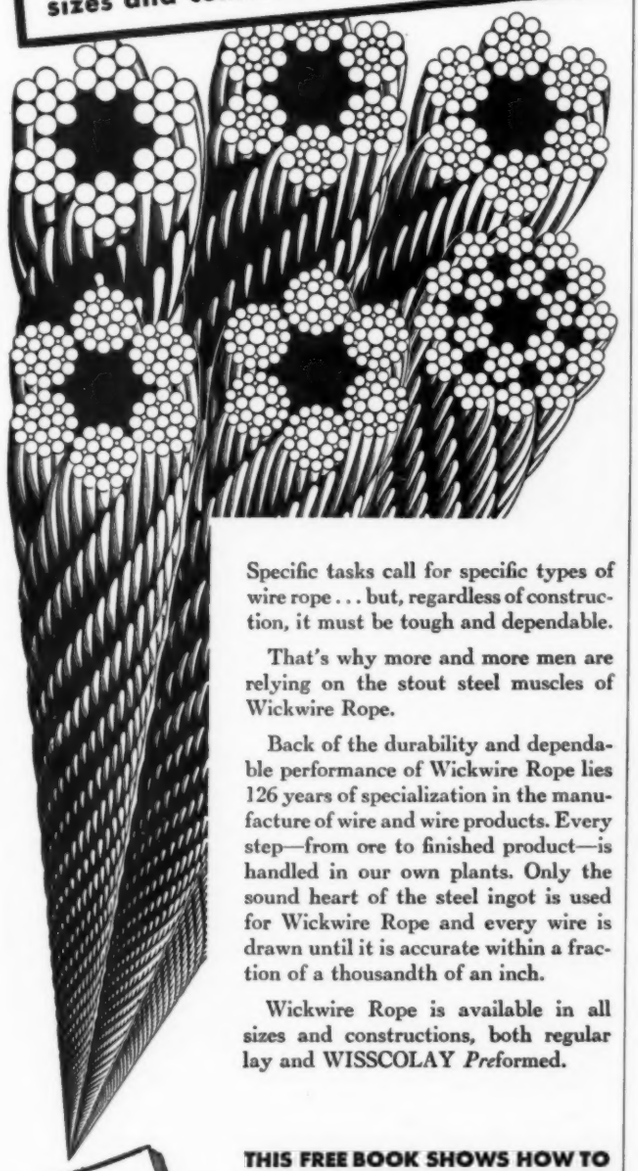


A 14-in feeder installed to feed primary crusher

be secured in 5 lengths from 6 ft. to 14 ft. and in 4 widths from 30 in. to 48 in. The illustration shows a 14 in. feeder installed to feed a primary breaker. The feeder is arranged for clutch control from an operator's platform. This is a heavy duty feeder. The pans are ½ in. forged steel plate, formed to overlap to impart great strength and rigidity. These overlapping pans, together with the sideboards, provide a continuous path for the materials, and reduce spillage. The overlapped pans also provide a corrugated surface which prevents slippage under the load. Interlocking malleable castings, bolted to the pan ends, form a continuous wall along each edge of the feeder bed, and further reduce spillage. The pans are carried on heavy chains which in turn are supported on large idler rollers; the rollers being so spaced that heavy impact and shock can cause no damage. The end shafts are of large diam-

WICKWIRE ROPE

sizes and constructions for every need



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CF&I

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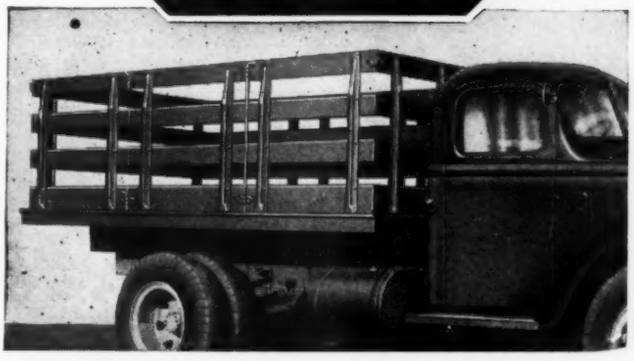

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DIETZ LANTERNS will not fail or falter as long as a drop of oil remains to burn. Many models will give light and safety for an entire weekend with plenty of kerosene left to spare.

Keep your DIETZ LANTERNS in good service—ready for use the moment needed.

Do not gamble with light and safety. DIETZ LANTERNS and DIETZ ROAD TORCHES give dependable light with safety—for over a century.

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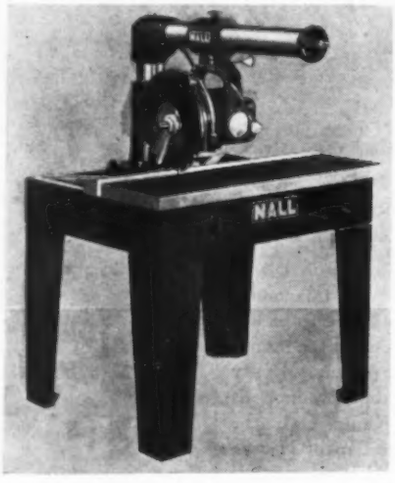
eter to give ample bearing surface and turn in heavy babbit bearings. Grease fittings readily are accessible for adequate lubrication. Cut-steel sprockets reduce maintenance costs and save chain wear. In the side-board models, replaceable wear plates are easily changed. Side-board extensions are available at extra cost.

7.

New Radial Arm Saw

A new radial arm saw claimed to have many new design and construction features has been brought out by Equipment Engineering Co., Division of The Nall Corporation, St. Charles, Ill. Among the features claimed for this new product are the following: No complicated adjustments. Controls all within easy reach



Nall Radial Woodworker

of the operator. The saw can be set up for any standard sawing operation in less than one minute. Construction employs both cast aluminum and welded pressed steel. Carriage rides smoothly on an endless chain of hardened steel balls. Both indexing and locking are operated with the same control. All vital operating parts are premanently sealed against sawdust and dirt penetration.

8.

New Drill Bit

A chisel-type drill bit having a cemented carbide cutting edge that withstands the impact of airhammers using air pressures of 80 to 120 lb, per square inch has been developed by Kennametal, Inc., Latrobe, Pa. The manufacturer reports that 50 ft. of holes 1⅝ in. in diameter have been drilled in solid granite with one of these bits before it was taken off the drill steel because of wear. Holes sizes at the end of drilling this

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Professor of Civil Engineering Emeritus, Yale University

"Surveying—Theory and Practice" is divided into four sections, furnishing a comprehensive discussion of Field Work, Office Work, Surveying Instruments, and Standard Surveys. The treatment is simple and understandable, since the book is directed to the average surveyor, rather than the specialist. Theoretical procedures of surveying are covered in detail, but in addition, the book contains thousands of practical suggestions on the subject. During the nine years devoted to the preparation of the book, the author had the cooperation of many specialists in the field and has included condensations of papers and extracts of reports and specifications by experts.

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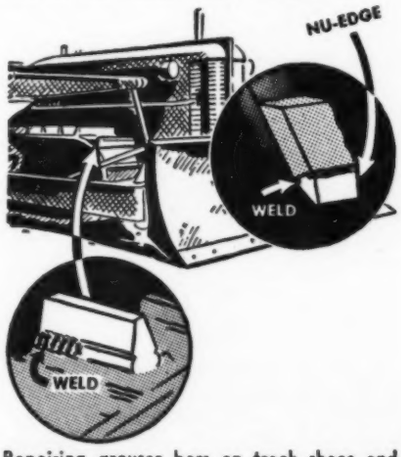
many feet of granite were approximately the same as when the holes were started. It was conservatively estimated that holes were only 1/32 in. smaller in diameter after drilling the 50 ft. of granite. By removing

Bit before and after drilling 50 feet of granite

the bit and resharpening it, the bit would be good for more footage. According to the manufacturer the new percussion bit drilled the granite at the rate of 1 ft. per minute. The Kennamental percussion bits are being manufactured at the present time in sizes of 1⅜ in. and 1⅝.

9.
New Edge for Bulldozer Blade

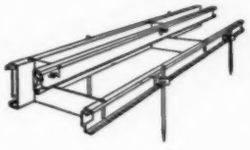
A special steel bar for salvaging bulldozer, scraper and maintenance blades has been placed on the market by Allied Steel Products, Inc., Cleveland, O. This Re-Nu-Edge bar can be welded to the square or worn edge of the blade with an all-purpose high grade steel electrode, such as an AWS 6012 or 6013. To prevent wear on the weld, this bead is then covered with a thin layer of hard-surfacing electrode. The same material is also used around the ends or corner castings where the most severe wear takes place. It is claimed this work-hardening steel edge will prolong the life of the blade many months.



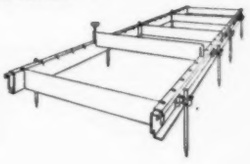
Repairing grouser bars on track shoes and rebuilding bulldozer blades with Nu-Edge

STEEL FORMS

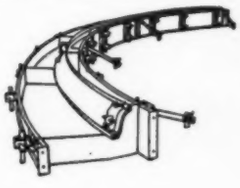
Curb Forms... Sections 10' long for either straight face or battered face construction. Steel forms for all special concrete curbs.



Combined Curb and Gutter Forms... Each 10' section consists of 1 each of back curb form, front gutter form and face curb form, also 2 each of face curb form supports, round stakes for back form and round stakes for gutter form.



Sidewalk Forms... 10' sections, slotted 12" for division plates, which are removed without disturbing side forms after concrete takes its initial set.



Rigid Radius Forms... Used for building concrete curbs or curb and gutters when all intersections or corners must match. Heltzel forms made in sets to form a specified radius.

Flexible Forms... Used when building radius curbs, curb and gutters or sidewalks where the radius is subject to frequent change or for serpentine work in park areas.

CONCENTRATED *Engineering* IN CONCRETE CONSTRUCTION

Heltzel BUILDS IT BETTER

- BINS, Portable and Stationary
- CEMENT BINS, Portable and Stationary
- CENTRAL MIXING PLANTS
- BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)
- BITUMINOUS PAVING FORMS
- ROAD FORMS (with flip curb and integral curb attachments)
- CURB FORMS
- CURB AND GUTTER FORMS
- SIDEWALK FORMS
- SEWER AND TUNNEL FORMS
- CONCRETE BUCKETS
- SUBGRADE TESTERS
- SUBGRADE PLANERS
- TOOL BOXES
- FINISHING TOOLS FOR CONCRETE ROADS

Heltzel Steel Form & Iron Company, Warren, Ohio

SEND ME STEEL FORM CATALOGS:

[ ] B-19 Steel Highway and Airport Forms
[ ] B-19A Steel Dual Duty Airport Forms
[ ] A-20 Steel Forms for Curbs or Curb and Gutters or Sidewalks.

Name_____

Address_____

_____

(Type of construction usually engaged in)

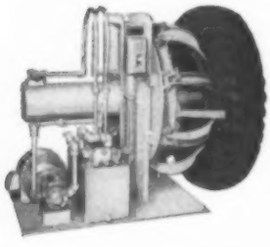
HELTZEL STEEL FORM & IRON CO. WARREN, OHIO · U. S. A.

FAST · SIMPLE · EASY

PRESTO HYDRAULIC TIRE DEMOUNTERS

- *Demount all size tires from 7.00-15 to 24.00-24*
- *Develop over 60,000 lbs. pulling pressure*
- *Built of rugged steel*

PRESTO Tire Demounters remove the most stubborn tires without injury to tire, tube, wheel or rim. Adjustable to all size tires on trucks, buses, and heavy vehicles.



MODEL A: Motor-operated hydraulic demounter, very rapid and powerful . . . for shops that change many tires daily. Full power control demounts any tire without effort.

MODEL B-1: Portable self-contained demounter with the famous manually operated Simplex Jenny center hole hydraulic jack; capable of removing any tire quickly and positively. Very compact and durable.

MODEL B-2: Portable, manually-operated demounter with double-acting hydraulic pump and cylinder. Simple and powerful. No motor or compressor required.

IMMEDIATE DELIVERY—
MAIL COUPON TODAY! *MONEY BACK GUARANTEE*

LEE ENGINEERING COMPANY
495 CENTRAL AVENUE, PAWTUCKET, R. I.

Send descriptive bulletin and prices. RS

NAME.....

STREET AND NO.....

CITY..... ZONE..... STATE.....

10.
New Spraying Machine for Weed Control

A highway spray implement, especially designed for use with 2, 4-D and other hormone sprays of the liquid type, has been placed on the market by J. A. Park Machinery Co., Pueblo, Colo. The machine delivers an even concentration of spray at 30 to 40 lbs. pressure with a spray coverage, at ground level—of 4 to 20 ft. The 750 gal. tank unit is trailed by any highway vehicle and operates most efficiently at speeds of five to seven miles per hour. The spray is controlled by a "free action" foot pedal, giving instant start and stop control of spray flow and allowing the operator both hands free for manipulating the spray bar. Spray bar is counter-balanced with "free action" ball bearing swivel joint. The operator may

Weed-O-Matic Highway Sprayer

raise or lower the spray bar by the pressure of one finger on the spray bar handle. Spray jets are spaced at 18 in. intervals along the spray bar. These jets are staggered at 10° offset, assuring complete spray coverage at ground level. Complete mixture of 2, 4-D and water is assured through pump circulation. Concentrate may be mixed as tank is being filled, or after tank has been filled. Amount of 2, 4-D concentrate flow into tank line is controlled by a manually set vacuum valve. Concentrate is taken into pump line from concentrate tank and circulated in main tank. Baffle in center of main tank prevents slop over and adds to circulation mixing action.

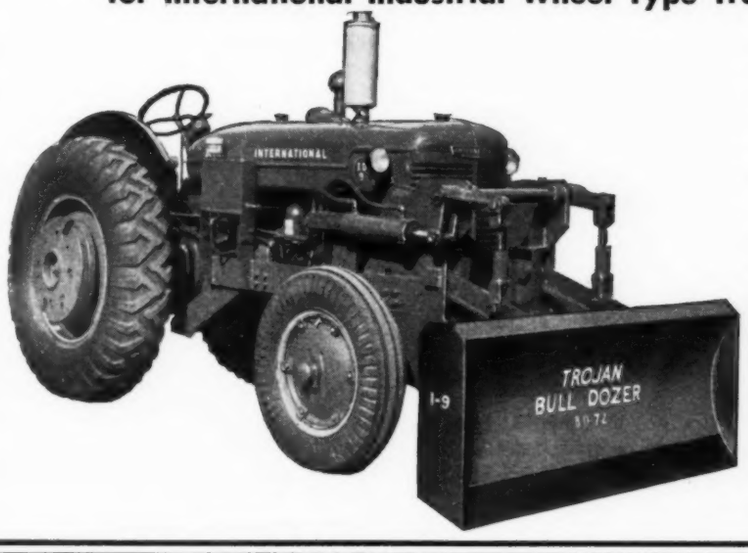
11.
New Spraywelder

A new type of powder metallizing unit, the Colmonoy spraywelder, has been announced by Wall Colmonoy Corp., Detroit, Mich. The spraywelder was developed for use in conjunction with the Colmonoy sprayweld process. With this new unit it is stated to be possible to combine the advantages of both welding and metallizing procedure. The unit is operated in the first part of the process as a powder metallizing unit to apply a uniform overlay of the Colmonoy hard-facing alloy. It is then used as a conventional welding torch to fuse this sprayed overlay to the base metal to obtain a fusion or molecular bond, stated to be identical to that obtained when the same alloy in rod form is applied by acetylene welding. The new unit has only two control valves, both of these being mounted on the gun itself. Once adjusted, the powder

TROJAN

COMBINATION BULLDOZER AND SNOW PLOW

for International Industrial Wheel Type Tractor



Trojan Bulldozers are designed for year-around service. The bulldozer blade and V type or reversible blade snow plows are interchangeable.

The parallel lift is a patented feature which raises the blade in a straight line and holds the vertical position throughout the lifting range. This device prevents digging in and consequent stalling and wheel slippage.

Trojan mountings are so constructed that the rear of the Tractor is free of all obstruction and permits installation of a rear power take-off whenever desired.

Three models are available designed to fit the I-4, I-6 and I-9 International Industrial Wheel Tractors.

Write for literature and specifications or see your International Industrial Distributor.

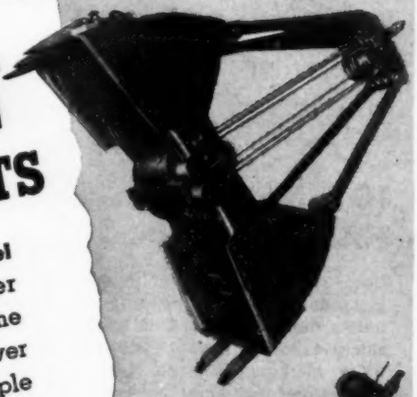
Contractors Machinery Co., Inc.

Dept. RS 71 Batavia, N. Y.

You Can't Beat Welded Construction

WELLMAN

Williams Type **BUCKETS**

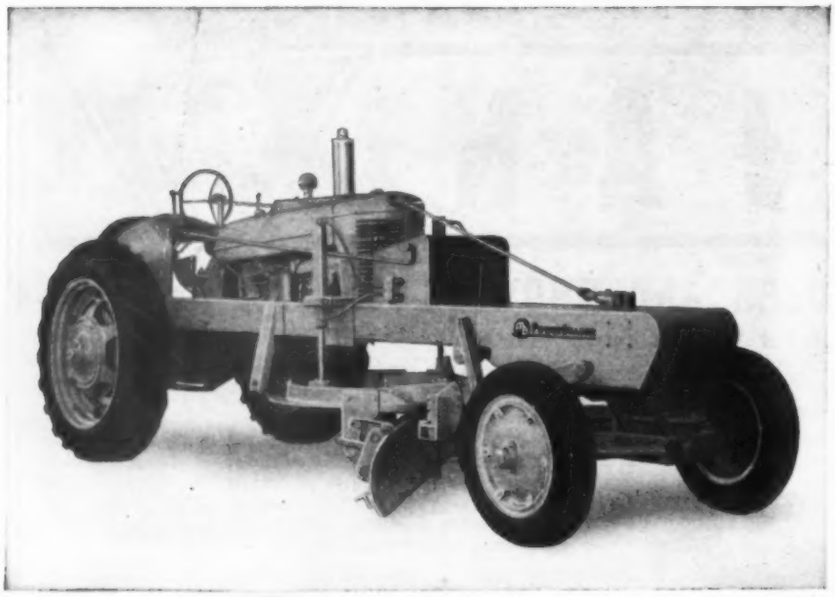


• Wellman pioneered **welded rolled steel construction** for longer life and greater service. It's the extra strength that gives the extra, low-cost digging power. Whatever your requirements . . . whether for Multiple Rope, Power Arm, Dragline, Power Wheel or Special Service—specify Wellman! 3/8 to 16½ yd. capacity.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY

7003 CENTRAL AVENUE • CLEVELAND 4, OHIO



Now MB POWER GRADER

In the new M-B Power Grader, Meili-Blumberg Corporation, makers of construction and industrial equipment for the past twenty-five years, have combined many new features around International Power to give users low cost road and street maintenance and, with the full line of attachments, an all-year tool. Check these features:

1. Hydraulic power direct on moldboard gives maximum blade pressure.
2. Handles all types of maintenance fast — 2 to 16 miles per hour at low cost.
3. All blade and attachments controlled from operator's platform.
4. Worm gear center-post steering for ease of operation.
5. Big 12 x 38 low-pressure tires turn engine power into PUSH.
6. Powered by big 40 H.P. International Tractor.
7. Husky all-welded frame — resists twisting.
8. Balanced weight means easy steering, steady traction, with approximately 7500 pounds blade pressure.
9. Built rugged to do tough jobs.
10. Attachments for every job — scarifier, snow plow, bulldozer, leaning front wheels, all-weather cab.

MB MARKER

10 TIMES FASTER THAN HAND STRIPING . . . . .

Does slow, tedious hand striping make it impossible for you to keep up with today's traffic demands? Does it endanger your safety record? Then consider using M-B Street Markers. With an M-B Marker, one man stripes ten times as fast as the man marking by hand. The machine handles ALL types of striping . . . can also be used as an all-purpose paint sprayer. Requires no experience. Hand-propelled or self-propelled models.

Complete Markers for Industrial, Street and all Highway Marking jobs. Ask for Bulletin No. 121.

MB MEILI-BLUMBERG CORP.

BOX RS-3, NEW HOLSTEIN, WISCONSIN

flow may be stopped and started at will by pressing or releasing the trigger. The gun is light in weight and perfectly balanced. It may be hand operated or held in a vise or with an attachment in the tool post of a lathe. Because of its design, it may be easily operated in all positions. While the unit was primarily designed for spraying Colmonoy alloys, it will handle other powdered compositions equally well. The price of the unit is very low, in comparison with its performance. The Spray-welder unit consists of the gun, all necessary hoses, with connections. The hopper for the powdered metal and the carburetor are combined in a single unit. In addition a panel to hold all the equipment is provided.

12.

New Towing Cable

A heavy duty cable for straight or choker-hitch towing that is only 1/5th the weight of chain of equal strength, has been announced by the Wire and Cable Division, Wind Turbine Co., West Chester, Penn. This Bulldozer Tenton is made of wire rope, and has a minimum breaking strength of 20,000 lb. It will handle 4,000 lb.

Bulldozer Tenton Towing Cable

loads safely under all towing conditions. The special heat-treated aluminum alloy thimbles and the Pres-Tite cable connectors holding them, are rustless. These cable connectors eliminate the more undesirable features of a splice. Each thimble will fit through the other, thus permitting the cable to be used either as a slip noose or as an ordinary tow cable, hooking over standard towing attachments. If desired, it is also furnished with a sliding choker hook. This enables the cable to be used as a sturdy, lightweight and easily attached choker hitch for clearing land, hauling logs or rocks, and for many other purposes. The Bulldozer Tenton comes in stand-

ard lengths of 10, 12, 15, 20, 25 and 35 feet. The cable is ½ in. 6x19 improved plow steel wire rope, galvanized against rust.

13.

New Wire Cord Tire

Substituting high tensile steel wire for cotton and rayon cord, The Firestone Tire and Rubber Co., Akron, O., is now in production on a wire cord tire. The tire is built up of piles of rubberized wire cord in the same manner as the conventional cotton or rayon cord. With the exception of the original ply preparation, the same machinery and fundamental

Part of the operation by which the fine steel wire is fed into tire ply construction by newly developed tire building machines. The cut-away tire section in the background reveals the four-ply wire cord

tire building methods are used. However, because of the greater strength of the wire cord, fewer plies are required than with cotton or rayon. The wire cord is but .036 in. in diameter. It is composed of several strands of wire .0058 in. in diameter, only slightly larger than a human hair, twisted together. Roughly, each 9.00—20 four ply wire cord tire contains more than 55 miles of the hair-like strands. So fine is the strand that two miles of it weighs only a pound, which means that the 9.00—20 tire contains only about 28 lbs. of steel.

14.

The Owen Loader

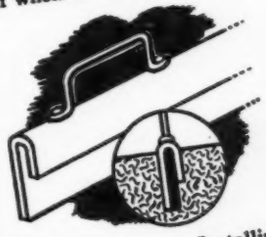
A loader that can be mounted on a truck or on a tractor has been placed on the market by the Marion Machine Co., Marion, N. C. Features of the loader include a double hydraulic action produced by two sets of hydraulic cylinders; an "arm and shoulder" movement that makes the bucket travel in two small arcs; and a "steam shovel" crowding action, produced by the hydraulic bucket ram exerting a "crowding" impulse against the loading arm. The speci-

with Keystone

Asphalt Mastic Board DUMMY JOINT

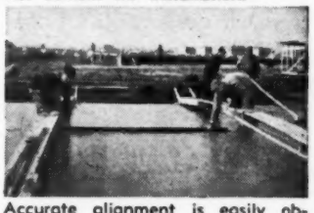
A revolutionary type of paving joint for transverse or longitudinal installation where economy dictates "weakened plane" type contraction joints. Maximum rigidity obtained without expensive installing machinery.

Keystone dummy joints can be used transversally or longitudinally. Designed to give maximum rigidity, are absolutely waterproof, low in cost and easy to handle. Shipped in flat sheets at job specified lengths, sheets are scored at specified widths and are simply broken off when needed.



Dummy Joint Installing Channel—This 12 gauge steel "U" shaped strip simplifies and speeds the installation of Keystone Dummy Joint. Made in lengths to match the joint and just wide enough to receive the joint and still withdraw freely.

Dummy Strip is easily broken off and carried out on bridge over wet cement for installation.



Accurate alignment is easily obtained when joint and installing channel are pressed into cement.

Steel installing channel is withdrawn leaving joint imbedded in concrete. Process is repeated.

Ask about the NEW KEYSTONE EQUIPMENT LINE

KEYSTONE offers contractors a joint slitting machine, concrete curing compound spray machines and rubber asphalt joint sealing compound kettles at accepted manufacturer's prices. Write or wire.

KAP

KEYSTONE ASPHALT PRODUCTS COMPANY

A Division of the American-Marietta Company

43 E. OHIO STREET, CHICAGO 11, ILLINOIS

EVERY DAY A WORKING DAY

THE VERSATILE HIGHWAY MODEL "E"

Here is the four-way answer to street and highway problems. The new *Highway Model "E" Spreader* can be used for positive ice control in winter, dust control with calcium chloride in summer, for spreading seal coats on oil, and, by removing the distributor disc it is ideal for spreading small rock and chips for shoulder maintenance. When operating as an ice control unit, the *Model "E"* casts sand or cinders *low* to the highway, eliminating interference with traffic. Material is spread ahead of rear wheels of truck providing traction for truck and *safety* at any operating speed. It will cover the full width of a 2 or 4-lane highway in one operation. All controls are within easy reach of the driver's seat making the Model "E" a labor saving, one-man unit. Furnished in four lengths to fit any truck chassis. Write for complete details.

For More Profitable Material Spreading—THE HIGHWAY MODEL 'R'

AVAILABLE IN SIZES FROM 8 TO 13 FOOT WIDTHS.

COMPARE THESE TIME AND MATERIAL SAVING FEATURES

- Smooth spreading—no thick and thin spots. Spiral feed roller with agitator-conveyor provides fast even spread. Adjustable feed gate controls thickness. Width is adjustable from one foot to full width of spreader.
- Reversible transmissions permit forward or reverse motion simply by shifting lever.
- Swivel type self-coupling adjustable hitch allows traction wheels to remain in constant contact with ground regardless of position of truck or spreader. Entire unit is balanced for easy hook-up to truck.

Write for complete details

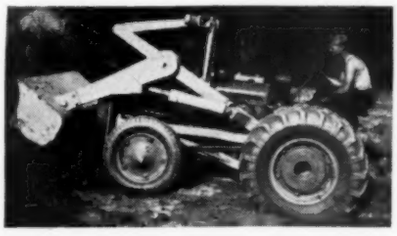
SOLD AND DISTRIBUTED BY LEADING CONSTRUCTION EQUIPMENT DEALERS THROUGHOUT THE UNITED STATES, CANADA, AND FOREIGN COUNTRIES

HIGHWAY EQUIPMENT COMPANY, INC.

605 D AVENUE N. W. • CEDAR RAPIDS, IOWA

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

fications for the loader when mounted on Case Industrial Tractor Model D-1 include the following: Bucket width 59 in. Capacity, level ½ yd., heaped ⅝ yd. Dumping clearance, 8 ft. Speed of travel (bucket) from front to back, 10 seconds. Back to front, 10 seconds. Wheel base 5 ft. 6-5/16 in.



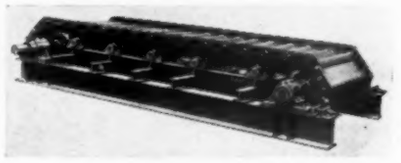
Owen Loader Mounted on Case Tractor

Width over all 6 ft. 7 in. Height to top of canopy with bucket lowered (in carrying position) 7 ft. 5 in. Height over all, bucket fully raised 13 ft. 8 in. Height of bucket in carrying position 6 in. to 6 ft. Length over all, bucket in highest carrying position 13 ft. Length with bucket on ground, 12 ft.

15.

New Feeder

A new feeder designed especially for super severe and extra tough jobs has been added to the line of Pioneer Engineering Works, Minneapolis, Minn. All wearing parts of the feeder are made of Oro Supermang steel, a superior grade of manganese steel. The apron consists of a series of Oro Supermang double beaded, overlapping and interlocking pans with vertical reinforced side flanges. The under sides of the pans are heavily ribbed to withstand im-



Pioneer Manganese Steel Feeder

pact and shock. The design of the side flanges reduces the leakage of fines to a minimum. One-piece Oro Supermang links, cast as part of the pans, serve as the chain links and present a continuous flat surface for carrying the apron over a series of rollers. Sprockets are built with reversible and renewable Supermang teeth for extra long life. Alemite fittings serve to lubricate the heavy shafts turning in extra heavy type angle pillow blocks. This new Pioneer-Oro manganese feeder can be secured in pan widths from 36 in. up

to 48 in. and in lengths from 6 ft. 3 in. to 16 ft. 9 in. (center to center of shafts).

MANUFACTURERS' LITERATURE

16.

Reflectors for Highway Use

The new Stimsonite all plastic reflectors for traffic signs, markers, clusters, etc., are illustrated and described in circulars issued by A. G. A. Signal Service Division of American Gas Accumulator Co., Elizabeth, N. J. This new reflector is an assembly of two plastic components, the precise optical element and a protective back of the same material, heat molded around the periphery to provide a true hermetic seal against infiltration of dust or moisture. Gasket and metal housing are both eliminated in this all plastic reflector.

17.

Earth Moving

Earth moving with proper application of track-type tractors, wheel-type tractors and motor graders highlighted, themes the 8-page color booklet Tracks, Rubber or Both published by Caterpillar Tractor Co., Peoria 8, Ill., manufacturer of both types of earthmoving equipment. Editorially and pictorially the publication stresses a message of the practical application of the theory that where tracks and rubber are concerned in earthmoving there is "a place for each and each in its place".

18.

Dump Wagons

The 16 cu. yd. clamshell bucket type bottom dump Dixson wagon is illustrated and described in a circular issued by Dixon Wagon, Inc., Alhambra, Calif. The clamshell dumping buckets are opened by a single cable control operated by the truck mounted power unit. Buckets may be opened from a few inches to a maximum horizontal distance of 9½ ft. at the will of the operator. Spreading of fine material in uniform layers or the discharge of large boulders is stated to be easily accomplished.

The JACKSON FS-7A
AN AMAZINGLY VERSATILE
CONCRETE VIBRATOR
(ELECTRIC)

Ideal for
THIN WALLS
•
HEAVY RE-INFORCED SECTIONS
•
HARD TO-GET-AT PLACES
and
MANY JOBS FORMERLY HANDLED ONLY BY LARGER VIBRATORS

NOW READY FOR DELIVERY

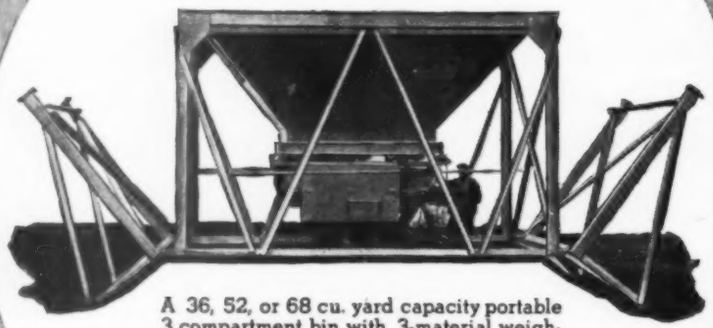
You're making no mistake when you put this vibrator at the top of your equipment requirements list; for with just the price of one machine invested, you're thoroughly equipped to handle a wide variety of jobs to best advantage. The motor weighs just 28 lbs., yet it will handle efficiently any of our standard heads up to 2⅜" x 18½", with flexible shafting of 24", 36", 7' or 14' lengths — delivering 7,000 to 10,000 vibrations per minute, depending on the length of shaft, size of head and consistency of concrete. Operates on AC or DC, 110-120 volt standard commercial power, single phase or Universal tools, and may be plugged into light socket or power plant. Vibrator head interchangeable with grinding attachment.

MODEL FS-7A

Write for detailed literature or recommendations for any special vibration application.

ELECTRIC TAMPER & EQUIPMENT CO. LUDINGTON MICHIGAN

ERIE TYPE "G A" PORTABLE AGGREMETER PLANTS



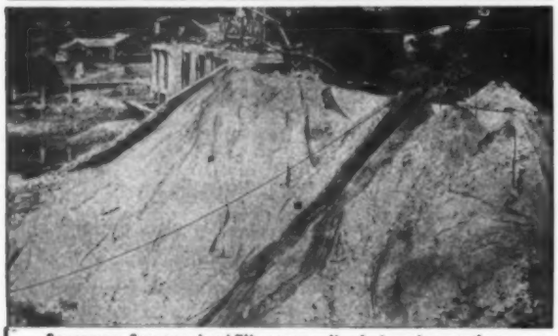
A 36, 52, or 68 cu. yard capacity portable 3 compartment bin with 3-material weighing AggreMeter is the answer to the need for a sturdy economical batching plant that follows the job. These are available with wide hopper to discharge batch into compartment trucks or with special truck mixer charging hoppers. Hinged legs provided for quick erection in field. Write for Bulletin GA-1 for details.

ERIE AGGREMETER PLANTS

Erie Steel Construction Co., 366 Geist Rd., Erie, Pa.

BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

YOU TOO CAN CUT COSTS with SAUERMAN LONG RANGE MACHINES



Sauerman Scraper backfills core-wall of dam by moving 40,000 cu. yd. of earth from adjacent hill.

DIG, HAUL and DUMP

... for a few cents a cubic yard.

SAUERMAN EXCLUSIVE CRESCENT BUCKET

Write for Catalog

SAUERMAN Power Drag Scrapers and Slackline Cableways have been proved the most economical and efficient equipment on large and small excavating and dredging jobs all over the world. With an adaptable operating radius of over 1000 ft., these speedy, powerful machines are solving difficult material handling problems and making savings for contractors everywhere. One man controls entire operation. Initial cost is surprisingly low. Power consumption is small and maintenance simple.

SAUERMAN BROS., INC.

588 S. CLINTON ST. CHICAGO 7, ILLINOIS

19.

Fifth Wheels

A 36-in. semi-automatic heavy duty fifth wheel weighing only 277 lb. less mounting plate and having a capacity of 60,000 lb. (suitable for 120,000 lb. capacity trailer) is described in a circular issued by Fontaine Truck Equipment Co., Birmingham, Ala. Exclusive features of this company's fifth wheels are noted and specifications are given.

20.

Asphalt Mixer

The new Foote Kinetic mixer is illustrated and described in a bulletin issued by The Foote Co., Inc., Nunda, N. Y. A diagram in the bulletin shows the principle of Kinetic mixing. This mixer handles all mixes cold, including sheet asphalt and asphatic concrete. The mixing principle makes possible the use of chemical additions which permit mixing of asphalt and wet aggregates without drying.

21.

Crushers

Series "S L" jaw crushers and Series "S G R B" star gear roll crushers, manufactured by the Universal Engineering Corporation, Cedar Rapids, Iowa, are fully described in new bulletins, just released by the corporation. Bulletin 4C gives complete specifications, capacity ratings, and dimensions together with cutaway and detail illustrations of the "S L" streamline jaw crusher. This roller bearing, overhead eccentric jaw crusher is available in 7 sizes. Bulletin 6A-2 provides similar information on the Universal roller bearing star gear roll crusher which is built in three sizes.

22.

Caterpillar Products

Many of the diversified types of work performed by Caterpillar Tractor Co. products are described and shown in the company's new 16-page color booklet, The "Caterpillar" Line in Action. The publication stresses applications of the entire line of products — Diesel-powered track and wheel-type tractors, Diesel motor graders, Diesel industrial and marine engines and electric sets, bulldozers, scrapers, cable controls and wagons.

23.

Air Tools for Contractors

A new 24-page, 2-color bulletin, "Air Tools for Contractors," has been released by Ingersoll-Rand Co., 11 Broadway, New York, N. Y. The bulletin is copiously illustrated with photographs showing air tools in action and demonstrating their versatility. A 2-page spread features some of the many uses of the Ingersoll-Rand impact wrench and will be of particular interest to contractors. A sectional view of the impact wrench is also shown. Additional pages are devoted to the various air-operated tools such as sump pumps, tampers, hammers, vibrators, drills, grinders, hoists, and other air tools. Contractors will find this bulletin a source of ideas for new and additional uses of air-operated tools and their accessories, many of which have numerous applications. A complete line of portable compressors from the small 2-wheel job to the large 500-CFM type is also shown.

24.

Typical Lumber Designs

The 1947 edition of typical lumber designs with quantities and materials lists for light and heavy frame structures, prepared by Timber Engineering Co., Washington, D. C., is now available to engineers, architects and builders. Over 200 typical lumber roof truss designs are listed for garages, stores, churches, theatres, gymnasiums, warehouses and hangars. Other designs cover low cost prefabricated houses, grandstands, various types of towers, bridges and railway structures. The designs employ the Teco connector system of construction and are offered as guides in designing for specific jobs. The Timber Engineering Co. maintains a staff of engineers, who will examine plans for the adequate and proper use of connectors. Most of the designs are available upon request free of charge.

25.

Transmission Belting

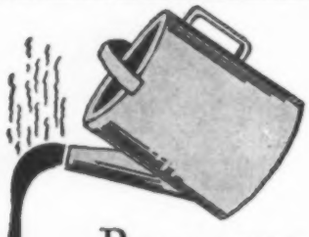
Specifications and construction features of Monarch brand transmission belting are outlined by Hewitt Rubber division of Hewitt-Robins, Inc., Buffalo, N. Y., in a 4-page product folder now being distributed. Monarch is claimed to withstand the shock loads of the heaviest service and to be especially effective when used in rock crushing plants, mines, quarries, and other power transmission operations.

SMOOTH POWER
Two-Cylinder
ONAN
THE NEW ONAN AIR-COOLED
"CK" ENGINE 10 H.P. 4-CYCLE
Two-cylinder horizontal opposed design gives the new, heavy-duty CK engine unusual running smoothness. Short, rigid crankshaft . . . 2-inch diameter main and 1⅝-inch diameter rod bearings . . . pressure lubrication . . . axial-flow cooling fan . . . aluminum construction giving 4-to-1 cooling advantage over cast iron . . . weighs only 97 pounds and fits neatly into 15″ x 19″ x 18″ space. Designed to solve engine power problems in industry, agriculture and other fields. Proven by thousands in use today . . . now in mass production . . . prompt delivery.
Also has: Built-in precision governor . . . downdraft concentric carburetor for wide-angle operation . . . oil bath air cleaner . . . fuel pump . . . oil pressure gauge . . . crankcase fumes exhausted to carburetor . . . hermetically sealed magneto ignition coil with easy-to-get-at breaker points, 2-qt. oil capacity.
ONAN ELECTRIC PLANTS—A.C.—350 to 35,000 watts in standard voltages and frequencies, D.C.—600 to 10,000 watts, 115 and 230 volts. Battery chargers —500 to 3,500 watts, 6 to 115 volts.
ONAN AIR-COOLED ENGINES—CK: 2-cylinder opposed, 10 h.p.; BH: 2-cylinder opposed, 5.5 h.p.; 1B: 1-cylinder, 2.5 h.p.
WRITE FOR illustrated, complete specifications
Electric Starting
Built-in electric push-button or automatic starting is optional; adds little to overall dimensions.
D. W. ONAN & SONS INC.
2816 Royalston Ave.
Minneapolis 5, Minn.
Onan PRODUCTS
ONAN 4-Cycle ENGINES

KEEP THOSE CONCRETE EXPANSION JOINTS SEALED ALL YEAR 'ROUND!

SPECIFY THE ORIGINAL Para-Plastic
REG. U. S. PAT. OFF.

PARA-PLASTIC conforms fully to Federal Specifications SS-F-336.



PARA-PLASTIC is the ORIGINAL hot-poured rubber seal for concrete expansion joints.

PARA-PLASTIC remains flexible all year 'round. Its elasticity is permanent in any temperature without breaking its bond with concrete.

PARA-PLASTIC is the positive and permanent top seal for concrete expansion joints all year 'round against the infiltration of water.

Write for further technical information

"STICK" WITH THE ORIGINAL ALL YEAR 'ROUND

SERVICISED PRODUCTS CORP.
6031 West 65th Street Chicago 38 Ill

26.

Maintenance Wall Chart

A new preventive maintenance wall chart, prepared by R. G. Le Tourneau, Inc., Peoria, Ill., especially for maintenance and service men, is now available for use as a quick guide in servicing and lubricating the Super C Turnapull. 17 by 22 in. in size, it is designed to hang on field office or shop wall, or wherever convenient for easy reference. The chart shows at what intervals the Super C Turnapull should be serviced, and lists the points to be checked or adjusted at each servicing. In addition, lubrication points are illustrated by 32 labeled photographs, and the chart carries recommendations as to what kind of lubricants to use and how often.

WITH THE MANUFACTURERS & DISTRIBUTORS

Tucker Heads Equipment Co.

R. S. Tucker is president of the Power Equipment Co. organized for sales and service of construction equipment in the trade area from Chattanooga, Tenn., to Bristol. Offices are located at 1218 Island Home Ave., Knoxville, Tenn., and 600 W. Manning St., Chattanooga, Tenn. The company is authorized distributors for the following manufacturers and their products: International crawler and wheel-type tractors and power units; Euclid hauling equipment; Foote pavers; CMC mixers, pumps, hoists, saws, light plant and concrete guns; Hough sweepers and payloaders; Hughes-

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.

VULCAN TOOLS — THE WORLD OVER — NOTED FOR QUALITY AND DURABILITY

VULCAN TOOL MFG. CO.
QUINCY, MASS.

IT'S POWERFUL
IT'S SELF-CONTAINED

The SYNTRON Gasoline Hammer

PAVING BREAKER

The explosive energy of gasoline—producing 2000 heavy, powerful blows per minute of a free Hammer Piston—make short work of

Busting
Cutting
Digging
Tamping

Write for illustrated folder.

SYNTRON CO.
384 Lexington, Homer City, Pa.

THAT'S SYNTRON

Keenan tractor cranes; Carco tractor winches; Leschen wire rope; Bucyrus-Erie bulldozers, scrapers and dozer shovels; Adams graders; Cleveland trenchers; Schramm air compressors and air tools; Quick-Way truck shovels; Hebard shop mules; superior tractor cranes; Raybestos-Manhattan belt, hose and packing.

Ceco Names Assistant Managers

Ned A. Ochiltree, executive vice president of Ceco Steel Products Corporation, 5701 W. 26th St., Chicago, Ill., has announced the following appointments in the Ceco organization: William W. Forst, 1531 S. Heidorn Ave. and William T. DuRell, 749 Newcastle, both residents of Westchester, Ill., were named assistant managers of Ceco's Screen and Weatherstrip Division. Floyd O. Goodwill, 421 N. Spring St., La Grange, Ill., was appointed assistant general credit manager. John D. Davenport, 245 Pick Ave., Elmhurst, Ill., and Harold J. Kovar, 3232 Oak Ave., Brookfield, Ill., were appointed assistant controllers—Davenport in the accounting branch, and Kovar in the cost branch. William H. Ellsworth, 4811 Highland Ave., Downers Grove, Ill., was named to the post of assistant general counsel. Paul A. Kuehn, 1324 S. 56th Ave., Cicero, Ill., becomes assistant purchasing agent, and David H. Hefele, 123 Blackhawk St., Aurora, Ill., assistant advertising manager.

Metalweld Appointed "Blue Brute" Distributor

John Oechsle

Metalweld, Inc., 26th and Hunting Park Ave., Philadelphia, Pa., has been appointed exclusive distributor in eastern Pennsylvania, south New Jersey and Delaware for the entire Worthington - Ransome "Blue Brute" line of concrete pavers, truck mixers and agitators, portable mixers, pneumatic placing equipment, grout injectors and concrete guns. For the past 20 years, Metalweld has been exclusive distributor for Worthington portable air compressors and tools, and the new franchise gives this firm the complete Worthington Pump & Machinery Corp. account. S. John Oechsle heads the Metalweld organization; John Norris Childs is vice president and M. L. McIntire is sales manager of the construction equipment division.

Gar Wood Appointment

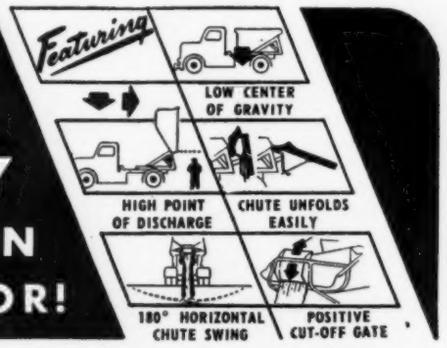
Nick Etten, first baseman of the New York Yankees, has become associated with Gar Wood's Chicago branch as assistant to the manager. He will return to the Yankees when the baseball season begins. Ben C. Helm, a veteran of more than 35 years in the automotive and allied industries, has been appointed to the staff of W. H. Hammond, vice president in charge of sales. His initial assignment will be to make a market analysis for the boat divisions. He will also assist in co-ordinating its sales activities. William H. Lingner, formerly with the hoist and body sales department, has been appointed assistant manager of the Gar Wood San Francisco branch.

Wales on Absence Leave

Raybestos-Manhattan, Inc., reports that E. A. Wales, Sales Manager of its Equipment Sales Division, with headquarters at 445 Lake Shore Drive, Chicago, is on a brief leave of absence to recuperate from a recent illness.

HERE IT IS!

THE LOW COST CONCRETE (READY MIX) BODY YOU'VE BEEN WAITING FOR!



The new lightweight Dumpcrete has all the features you need for hauling air-entrained concrete. Yet there is no expensive mixing machinery.

Even though it costs less in every way, the Dumpcrete is hauling a superior concrete. For air-entrained concrete is more uniform...more workable ... more durable ... can be finished sooner.

Today Dumpcrete users are hauling air-entrained concrete for more than 45 minutes with no segregation or bleeding, and with virtually no change in air content and slump. When concrete pouring is held up, the Dumpcrete goes to work hauling sand, gravel, earth or coal.

If you want to know how Dumpcrete users *are hauling more loads per day* and saving money on every yard, send the coupon today. There's no obligation.

MAXON CONSTRUCTION COMPANY, INC.
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DUMPCRETE DIVISION

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Firm_____
Name_____
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Fast Job-to-Job Moving Saves $$$
Today's increased cost of construction equipment requires top earnings from your investment.
Reducing job-to-job moving time to a minimum assures less idle time for every dollar of your equipment investment.
Consult your La Crosse dealer and he will show you why we say "Ship it Quick! Ship it Safe! Ship it on a La Crosse Trailer."
HEAVY DUTY
LA CROSSE
TRAILER CORPORATION
LA CROSSE, WISCONSIN U. S. A.
Dealers in all 48 States.

Hill Promoted by Gar Wood

E. B. Hill

E. B. Hill has been named director of factory sales for Gar Wood Industries, Inc. Mr. Hill, who has been with Gar Wood since 1925, was formerly district manager of the general line with headquarters in Chicago. In his new post he will supervise all factory sales activities, including those of the company's Buckeye Traction Ditcher and St. Paul Hydraulic Hoist divisions.

Cummings Appointed Manager

Harry B. Cummings has been appointed manager of the Tar Department of the Tar Products Division of Koppers Co. Inc., Pittsburgh, Pa. Mr. Cummings' new duties will include direction of the production and sale of various tar products, including road and roofing materials, preservatives, pitches, acids, bases, naphthalene, oils, and other products. The Tar Department also handles the sales of the coated metal sheets produced by the Coated Products Department.

New Galion Representative

John C. Painter has been appointed district representative of The Galion Iron Works & Mfg. Co., manufacturers of rollers and motor graders. He will cover the states of North Carolina, South Carolina, Florida, and Georgia. Mr. Painter is a graduate of Grinnell College, Iowa, where he majored in mathematics and engineering. He had four years' practical experience in sales and road construction work before entering the Army. On active duty with Corps of Engineers for four years; rank of captain.

HOT or COLD
Mix Asphalt

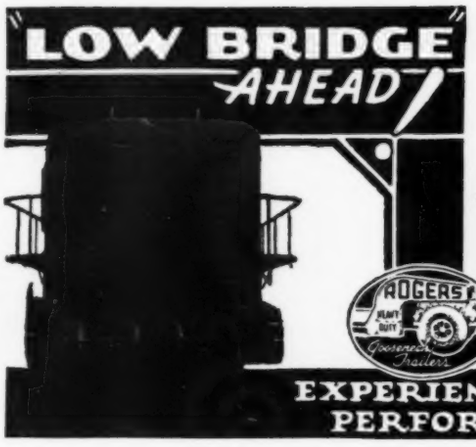
DEPENDABLE

THE SIMPLICITY SYSTEM COMPANY
CHATTANOOGA, TENNESSEE, U.S.A.

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

ACCURATE . . . DEPENDABLE . . . ECONOMICAL—
Reduce maintenance and operating expenses, cut labor costs, insure accurate, uniform coverage with dependable Etnyre "Black-Toppers". Designed to do the job better . . . faster . . . cheaper. See your Etnyre dealer or write, wire or phone us today for complete details.

E. D. ETNYRE & CO., Oregon, Illinois



the answer to that problem is this

ROGERS GIRDER-TYPE TRAILER

Rogers builds trailers for unusual needs, embodying characteristic features of fundamental design, but modified to meet special requirements. With a Rogers Girder Type Trailer there is slight chance of being confronted with a headroom clearance problem. Special construction affords an unusually low bed.

ROGERS BROTHERS CORPORATION
110 ORCHARD ST. ALBION, PA.

New Differentials for Trucks

Detroit Automotive Products Corporation is now in production and is supplying its distributors with 28 models of its Nospin differential in four basic sizes, series "C," "G," "J" and the new "E," according to Ivan Graham, manager of sales and service of this firm, which was formerly the Thornton Tandem Co. Detroit Automotive is making available at this time the new series "E" Nospin differentials for two-speed axles of the Eaton 1350 series. These differentials can now be installed in the two-speed axles of such popular trucks as the Ford 2-ton, Dodge WFA and WHA, Fargo FKA4 and FKA6, International KS5 and KS6, Federal 15K and 18K, GMC models EC and EF, series 300 and 350, Diamond T models 404, 409, 409SC, R-950, and Canadian Chevrolet Maple Leaf. Latest additional models released in February include the series "J" Nospin differentials for several popular truck models including: Dodge WF and WH, and Fargo FK4, and FK6 trucks all equipped with single speed axles, and Chevrolet 2-ton trucks having two-speed axles.

M-R-S Moves to Flora, Miss.

The M-R-S Manufacturing Co., manufacturer of Mississippi wagons, has moved from Jackson, Miss., to Flora, Miss., where it has acquired a part of the Mississippi Ordnance Plant. The property consists of 406.13 acres of land and eight buildings with a total of 79,000 sq. ft. of floor space, including a modern plant structure of 52,400 sq. ft. and an office building of 12,500 sq. ft. The purchase of a larger plant site was decided on over a year ago, when it became apparent that greatly increased production facilities would be necessary to meet the growing demand for Mississippi wagons.

Reid Promoted by Universal Atlas

Henry P. Reid, assistant to president, has been appointed Chief Engineer of the Universal Atlas Cement Co., United States Steel Corporation Subsidiary, effective Jan. 16. Mr. Reid has been associated with the company for 23 years, having served successively as special engineer, operating engineer and, since 1942, as assistant to president.

C.I.T. Moves Chicago Office

Due to steadily increasing business, the C.I.T. Corporation has found it necessary to occupy enlarged offices at 1 North LaSalle St., Chicago, Ill., which were formally opened on Feb. 17. W. G. Catheart, Vice President in charge of the Chicago regional headquarters of C.I.T., states that his company anticipates a large volume of business in '47. A looked for up-turn in the production of construction equipment will make it possible for more contractors to secure the machinery they need to handle the diversified construction projects which will develop in the ensuing months, and C.I.T. has geared their facilities to meet both present and future financing requirements of the construction industry.

Appointed Vice President

Stephen S. Conway has been appointed vice president in the sales department of the Brake Shoe & Castings Division, American Brake Shoe Co. He formerly was assistant vice president in sales and has been with the Brake Shoe Co. since 1912.

The Man In the Crane Prefers AN OWEN BUCKET

Like the head on a hammer, the proper bucket on the crane assures maximum operating efficiency of the machine.

Crane operators prefer working with OWEN BUCKETS. For faster digging, discharge and ease of handling, Owen Buckets are unexcelled.

The OWEN BUCKET Co.
6070 Breakwater Avenue, Cleveland, Ohio
Branches: New York Philadelphia Chicago Berkeley, Cal.

FASTER LOADING, LIFTING, SCRAPING

"The Ottawa" Industrial Hydraulic Front End Loader saves hundreds of man hours on every job. A rugged heavy duty attachment for industrial type tractors that loads bulk materials, does light bulldozing jobs and operates as a portable crane. A year 'round labor saver—will do hundreds of odd jobs better faster. Handles loads up to 4,000 pounds, lifts to a height of 9½ feet. It is shipped complete with super-powered Hydraulic system. Bulldozer, Boom and Snow Plow attachment available to give you maximum productive use of your industrial tractor. Hundreds now in use by contractors, quarries, building material and coal dealers and municipalities.

Write today for prices and illustrated bulletin. Immediate shipment. Fits most models industrial tractors.

The Ottawa INDUSTRIAL HYDRAULIC FRONT END LOADER

OTTAWA STEEL PRODUCTS, INC.
OTTAWA, KANSAS

Paape New Euclid Sales Manager

W. W. Paape

W. W. Paape, district representative in the Chicago territory, has been promoted to the position of Domestic sales manager of The Euclid Road Machinery Co. He will take over his new duties March 28 at the main offices of the company in Cleveland, O. A graduate of the University of Illinois, Mr. Paape has been active in the construction industry for over 20 years. Prior to his Euclid connection he was sales manager of Syracuse Supply Co. and before that time served as representative for Caterpillar Tractor Co. and La Plant Choate Mfg. Co. E. F. Armington, former sales manager, will devote the major portion of his time to executive and management duties as secretary of the company.

Top Management Changes for Goodyear

Three important changes in the top management of The Goodyear Tire & Rubber Co. have been announced by P. W. Litchfield, chairman of the board. These changes included the resignation of Cliff Slusser as vice-president in charge of production and as a member of the board of directors. He will continue with the company as vice-president and general manager of the subsidiaries which operate Goodyear's domestic textile plants and coal mines. Mr. Slusser is succeeded on the board of directors and as vice-president in charge of production by Russell DeYoung, who has been vice-president and general manager of Goodyear Aircraft Corporation, a

RAPID!

Cuts concrete and cuts labor costs to 2½c per square yard. Applicable to floor work and different types of inside horizontal work.

Very efficient in maintenance work of highways.

Boom folds down and readily trailed by any light truck. Make your compressor treble its output by hooking it to this machine.

Rapid Pavement Breaker Co.
1517 Santa Fe Ave.
Los Angeles 21, Calif.

Miller Joins Koehring

J. A. "Jack" Miller, prominent in construction equipment sales in Minnesota for more than 20 years, has joined the sales staff of the Koehring Co., Milwaukee, Wis. Jack Miller, who started selling construction equipment back in 1922, was general sales manager of the Rosholt Equipment Co., with headquarters at Minneapolis, before joining Koehring. In his new position, he will work with Koehring distributors in the North Central states.

PORTABLE ASPHALT PLANTS
High Production—Low Cost

THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

RELIANCE

CRUSHING, SCREENING and WASHING UNITS

● Up to 2000 Tons a Day ●

Crushers
Elevators
Sweepers
Screens
Wash Boxes
Bins
Pulverizers
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Kettles
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Drag-Lines
"GAYCO"
Centrifugal
Air Separators

UNIVERSAL ROAD MACHINERY CO.
Kingston, N. Y.

Canadian Representatives: F. H. Hopkins & Co., Ltd.
340 Canada Cement Co., Montreal, Que., Can.

Heavy-duty trailers from 5 to 100 tons

SAFE FOR THE BIGGEST LOADS

HAULING CONTRACTORS everywhere depend on Jahn Heavy-Duty Trailers for safe, fast and economical moving of their heaviest loads like this 110,000-lb. transformer. Deep, wide flange main beams run the full length of the trailer. Cross-members and outriggers are I-Beam sections. Improved, fabricated gooseneck adds greater built-in strength. Positive, self-equalized braking at each wheel regardless of position of axle assures maximum safety. See your nearest Jahn dealer for details.

JAHN TRAILERS ALL OVER the WORLD

Reg. Trade-Mark

C. R. JAHN COMPANY

1345 WEST 37th PLACE, CHICAGO 9, ILL.

subsidiary. Fred W. Climer was elected to a new vice-presidency of the parent company in charge of industrial relations. He moves up from the position of assistant to the president where he has had charge of personnel and labor relations.

Opens Michigan Office

The Clay Sewer Pipe Association, Columbus, O., has opened a district office at 117 W. Genesee Ave., Saginaw, Mich. C. J. Bauer, Jr., District Engineering of the Clay Sewer Pipe Association, and its Michigan representative for the past six years will maintain his headquarters at the new address.

C.I.T. Opens New Offices

In order to better serve its rapidly growing list of southeastern clients, the C.I.T. Corporation has found it necessary to move from its quarters on Peachtree St., Atlanta, Ga., to new and more commodious offices at 66 Luckie St., N. W. This new regional headquarters was formally opened on Feb. 17.

Worthington Changes

Herman J. Schorle, Holyoke, Mass., works manager, Worthington Pump & Machinery Corp., has announced six changes in the executive functioning of the Holyoke organization, effective Feb. 1, 1947. All personnel are veteran members of the corporation's executive body. A. W. Soutter, formerly engineering assistant to the works manager, has been appointed purchasing engineer of the Holyoke Works. E. E. Foote, formerly purchasing agent, has been appointed assistant to the purchasing engineer. O. J. Schorer, formerly chief engineer of the Rock Drill & Air Tool Division, has been appointed engineering assistant to the works manager. P. H. Nast has been appointed chief engineer of the Rock Drill & Air Tool Division. F. G. Riedel, formerly chief engineer of the Air Conditioning & Refrigeration Division and works director of all research, has been appointed chief engineer of the Freon Compressor Division, retaining his title of works director of all research. Justin Neuhoff has been appointed chief engineer of the Air Conditioning and Condensing Units Division.

New Lima Assistant District Managers

The Shovel and Crane Division of Lima Locomotive Works, Inc., Lima, O., has announced the appointment of M. E. Army and Ralph Rodgers as assistant district managers of the Pacific Coast District. Mr. Army will continue to make his headquarters with Smith Booth Usher Co., 2001 Santa Fe Ave., Los Angeles, and Mr. Rodgers will have his office with Paul Fenwick, district manager for the Lima Co. with offices at 1315 Howard St., San Francisco. Both Mr. Army and Mr. Rodgers have been associated with the Lima organization for a number of years in the capacity of sales and service engineers.

New Richkraft Distributor

Dealers Wholesale Co., 4599 Pacific Blvd., Los Angeles 11, Calif., has been named Richkraft distributor in Southern California; Arizona; Clark County, Nevada; and Sonora and Lower California, Mexico. The complete line of Richkraft building and construction products will be handled.

ASPHALT and TAR KETTLES

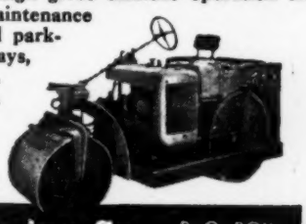
FIRE PROOF—OIL BURNING
Hand and Motor Driven spray.
Many sizes. Write for catalog.

Elkhart White Mfg. Co. Indiana

Try a **Pierce-Bear** *on that tough job!*

3½ TON — VARIABLE WEIGHTS

Engineered refinements and rugged strength have earned for these rollers enviable performance records. Compact design gives efficient operation in close quarters. Ideal for maintenance work on highways, airports and parking areas. Fine for driveways, docks, etc. Easy to operate. They do a good job at low cost.



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Lewis Manufacturing Co. P O BOX 500
SAN ANTONIO 6, TEXAS

CLEARING HOUSE

SALES AGENTS WANTED

Wanted—Municipal Equipment Sales Agents or Distributors

To sell patented Street Signs, Traffic Signs, Reflector Signs, etc., to Municipal Officials.

MUNICIPAL STREET SIGN CORP.
777 Meeker Ave. Brooklyn 22, N. Y.

EQUIPMENT WANTED

WANTED IMMEDIATELY

COMPLETE SET OF CRAWLERS FOR LORAIN MODEL 82 SHOVEL

JOHN FABRICK TRACTOR CO.
3100 Gravois Ave. St. Louis, Mo.

WANTED IMMEDIATELY

CATERPILLAR D7 TRACTOR—9G Models.
CATERPILLAR D4 TRACTORS with or without TRACKSON HI-LIFT.

Box 105
Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

WANTED IMMEDIATELY

TRUCK CRANES, LATE MODEL, ANY MAKE—CASH

JOHN FABRICK TRACTOR CO.
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FOR SALE

FOR SALE

Int'l TD 40 Diesel, Serial #7081, with Gar Wood Hydraulic Dozer, in excellent cond.
Chrysler Industrial Gas Engine, used one year on ½ yd. backhoe.
International K5 1941 3 yd. Dump.
Diamond T 1931 4½ yd. Dump.
Army Studebaker, 6x6, new, with 9 yd. New Dump.
Box 106, Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

FOR SALE

5—Jaeger Form Tampers—Gasoline Engine Driven—adjustable for 7" to 10" forms. New, each $400.00
1—Carr Form Grader..... $1,050.00
1—Huber 6 to 7-ton, 3-wheel, Roller, excellent condition $1,500.00
1—American Concrete Bump Grinder, Gas Engine powered on solid rubber tires (excellent) $325.00
1—Littleford Trail-O-Distributor (new) $1,850.00
1—Seaman Pulvimixer, Model MDH72, Waukesha Engine MRZU (New) $1,450.00
1—Schramm 105 ft. Air Compressor, Electric Starter, Buda Engine on 2 pneumatic tires (rebuilt)..... $1,100.00
2—Sullivan 105 ft. Air Compressors, Model WK60 Buda engines on 2 pneumatic tires (rebuilt) each..... $1,150.00
1—Rogers Track Pin Press Trailer mounted complete with fittings (excellent) $1,250.00
1—Jaeger Model CS-20 Concrete Spreader, adjustable 20 to 25 ft. (guaranteed as new) $5,000.00

THE LORENZ EQUIPMENT CO.
547 West Rich St.
Columbus 8, Ohio

FOR SALE

FOR SALE

International TD14 Tractor w/ Hughes Keenan Crane Case, Model VAI-W Warehouse Tractors, 22 HP. New suction and discharge hose.

JOHN FABICK TRACTOR CO.
3100 Gravois Ave. St. Louis, Mo.

Surveyors stakes for sale. ¾" x 2" x 14" or 16", $1.75 per cwt. 18" or 20", $2.00 per cwt. F.O.B. Durango.

JOHNSON SUPPLY CO.
Durango, Colorado

TANKS — PILING, ETC.

25—10,000 gal. Car Tanks with Coils.
75—4200 gal. cap. Vert. Steel Tanks.
200 Tons Carnegie 27-lb., 40-ft. Piling.
2—1,000 ft. Chg. Pneu. Diesel Compressors.

R. C. STANHOPE, INC.
60 East 42nd Street New York 17, N. Y.

FOR SALE

1 Buffalo Springfield 3-wheel roller, Serial #15667—6-8 ton.
1 Adnun Black Top Paver with screed attachment, 12-ft. spread, with LeRoi motor Model #-266P-3. Serial #1014, Engine #171370.
1 TDF-14 Tractor and Bulldozer complete, Serial #1850.

Prices for all this equipment will be furnished upon request of interested persons.

E. B. McGURK, INC.
355 Barbour St. Hartford 1, Conn.

FOR SALE

50-TON "RELIANCE" CRUSHING PLANT

15"x30" Crusher with 2 extra sets of New Jaws.
One Bucket Elevator, 38' center to center, 20" Buckets.
One Roller Screen 58" dia. x 17' long, 1¼" to 3".
Tailings Conveyor.
100-ton capacity Steel and Wood Bin.
One Model L90 6-cyl. Allis-Chalmers Gas. Engine with outboard bearing.
One Model M40 4-cyl Allis-Chalmers Gas. Engine with outboard bearing. First class condition.

ABERTHAW COMPANY
133 Southampton Street
Boston 18, Mass.
Phone Highlands 6700

FOR SALE

FOR SALE

Two Etnyre Road Oil Distributors

Approximately 1,300 gallon oval tanks, mounted on two Model N Autocar Trucks equipped with 10:50x20 and 11:00x20 tires. Westinghouse air brakes, auxiliary low range transmissions. Guaranteed mileage —71,663 and 47,959. Bought new by present owner and being replaced by large tractor trailer distributors. Both distributors bought new with chassis. Burners, pumps, and bars in first-class condition. Both complete trucks in A-1 condition ready to go to work immediately. Price $5,500.00 each. Box No. 104.

Roads & Streets,
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FOR SALE

1—4 Ft. Symons Standard Cone Crusher, coarse bowl, excellent condition.
1—60" Allis-Chalmers Rotary Screen and Scrubber.
1—Telsmith Reduction Crusher, Type 2F.

CLEARWATER GRAVEL COMPANY
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FOR SALE

2—White Diesel Tandem Trucks —powered by Cummins Model HB600 Engine, 200 H. P.

IMMEDIATE DELIVERY.

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FOR SALE

1 Crane—P&H ¾ Cu. Yd. 40' boom with 1 Cu. Yd. Clamshell Bucket, completely reconditioned. Guaranteed.
1 Crane Dragline with fairleads. 1⅛ Cu. Yd. Caterpillar D13000 Diesel, Guaranteed excellent condition.
2 Tractors, Case LAI Tractor, New Dual rear tires. Air Compressor mounted. Guaranteed excellent condition.
1 New Hough Payloader, hydraulic front end loader.
1 New Tractor Crane-trackson. 18' Telescopic Boom Winch and spare parts on TD9 International Tractor.
1 New TD14 International Diesel Tractor. Front mounted winch, lights, mudpan, radiator guard, spare parts. Bulldozer Blade, extra.
1 HD14 Allis-Chalmers Tractor, completely rebuilt. New rails, rollers, shoes, engine completely rebuilt. With new Buckeye bulldozer blade. Dual drum power control unit. With C16 Hiel Scraper, 16 Cu. Yds. Perfect. Rubber like new.
1 TD18 International Diesel Tractor with Dual Drum Power Control Unit with Woolridge bulldozer blade. Perfect. Rebuilt. Guaranteed.
1 Galion Grader. 12' Blade. Completely rebuilt. New rubber.
1 Caterpillar Grader, 212 Diesel. 10' Blade with inclosed cat. Completely rebuilt.

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Pittsburgh Steel Products Co. Revived

The Pittsburgh Steel Products Co., wholly owned subsidiary of Pittsburgh Steel Co., has been revived and expanded to become the marketing division for the parent company's line of construction products and new lines of companion and diverse products as well. Top management group of the subsidiary company is the same as for the parent organization headed by Joseph H. Carter, President; J. K. Beeson, Executive Vice President; Joseph A. Voelker, Vice President; J. H. Morrison, Vice President in Charge of Operations. Thomas C. Phillips and Robert L. Glose have been elected vice president in charge of sales and general manager of sales respectively of the subsidiary organization, Pittsburgh Steel Products Co.

New Koppers Appointments

Recent appointments in the Wood Preserving Division of Koppers Co., Inc., Pittsburgh, Pa., have been announced as follows: O. E. Stewart, Manager of Personnel Department; D. A. Mitchell, General Superintendent of Plants and Operations; E. R. Snodgrass, Chief Engineer.

A. E. Palmer Dies

Arthur E. Palmer, field representative for the Engine Sales Department of Caterpillar Tractor Co., Peoria, Ill., since 1937, died in New York on Jan. 7. Mr. Palmer, as a field representative, served the states of New York, New Jersey, Pennsylvania and Massachusetts and was well known among diesel engine consumers and general manufacturers throughout that region. He first became associated with "Caterpillar" in 1936 when he entered the engineering department as a designing engineer.

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PILOT
LANTERN
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ON EVERY JOB
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It's Stormproof!

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For steel signs--front entrance mounted button, 5 sizes.

For wood installations 5 sizes

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FOR SECONDARY ROAD CONSTRUCTION

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Here's equipment designed especially for mixed-in-place construction — to operate in connection with other general purpose equipment. Wherever aggregates are used it thoroughly pulverizes, mixes and aerates aggregates with binder—rapidly and economically. Also ideal for soil cement stabilization. Safe and easy to operate . . . adjustable to any tractor . . . made 4 standard sizes, 4', 5', 6' and 7'. Write for details.

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Shunk Snow Plow and Ice Removal BLADES

Proved record of superior performance. Made of specially developed steel to withstand severe service conditions.

FOR ALL TYPES AND MODELS OF SNOW PLOWS
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Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.

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Check reference to advertisement or to items of equipment or materials on which you wish to receive information. Give your name and address in the space at foot of page (if convenient, please print or use typewriter), detach page and mail to ROADS AND STREETS, Readers' Service Department, 22 West Maple Street, Chicago 10, Ill. We will pass your inquiry along to manufacturers and see that you get desired information promptly.

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- ☐ Bins and Hoppers
- ☐ Conveyors
- ☐ Crushers
- ☐ Portable Plants
- ☐ Screens

BITUMINOUS:
- ☐ Batchers
- ☐ Finishers
- ☐ Distributors
- ☐ Dryers
- ☐ Heaters
- ☐ Plants (central)
- ☐ Plants (travel)

CONCRETE:
- ☐ Batchers
- ☐ Buggies and Carts
- ☐ Finishers
- ☐ Joints, Expansion and Contraction
- ☐ Reinforcement Accessories
- ☐ Metal Road Accessories
- ☐ Mixers (under 1 yd.)
- ☐ Mixers (1 yd. up)
- ☐ Pavers
- ☐ Reinforcing Steel
- ☐ Road Forms (1000' set)
- ☐ Tower
- ☐ Truck Mixers

CRANES:
- ☐ Crawler Mounted
- ☐ Truck Mounted
- ☐ Piledrivers

GRADERS:
- ☐ Blade, self propelled
- ☐ Blade, pull type
- ☐ Blade, under truck
- ☐ Elevating

LOADERS & TRENCHERS:
- ☐ Front-end loader (tractor mounted)
- ☐ Loader, bucket type and belt type
- ☐ Trencher or Ditcher

HAULING EQUIPMENT:
- ☐ Dump Trucks, self-powered
- ☐ Dump Wagons, tractor drawn
- ☐ Flatbed Trailers
- ☐ Other Trucks

PUMPS:
- ☐ Centrifugal
- ☐ Concrete
- ☐ Diaphragm
- ☐ Mud Jacking
- ☐ Piston
- ☐ Wellpoint

POWER UNIT: (Independent)
- ☐ Gasoline
- ☐ Diesel
- ☐ Electric

ROLLERS:
- ☐ Power (Smooth)
- ☐ Pneumatic Tire
- ☐ Sheepsfoot

TRACTORS:
- ☐ Crawler
- ☐ Rubber-Tired

TRACTOR EQUIPMENT:
- ☐ Dozers
- ☐ Power Control Units
- ☐ Rippers
- ☐ Scrapers, tractor drawn
- ☐ Scrapers, self-powered

BUCKETS:
- ☐ Clamshell
- ☐ Concrete
- ☐ Dragline
- ☐ Orange Peel

SHOVELS & DRAGLINES:
- ☐ Crawler (under 1 yd.)
- ☐ Crawler (1 yd. up)
- ☐ Truck Mounted

ROCK DRILLS & AIR TOOLS:
- ☐ Air Compressors
- ☐ Backfill Tampers
- ☐ Clay Diggers
- ☐ Concrete Vibrators
- ☐ Drills, cabel tool
- ☐ Drills, tripod and wagon
- ☐ Drills, rock, hand-held
- ☐ Paint Sprayers
- ☐ Paving Breakers
- ☐ Riveters and Chippers

MISCELLANEOUS:
- ☐ Buildings, portable
- ☐ Earth Drills, power
- ☐ Light Plants
- ☐ Lubrication, Service Truck
- ☐ Mowers, Highway
- ☐ Power Saws
- ☐ Soil Stabilizing Equipment
- ☐ Snowplows, rotary
- ☐ Snowplows, v or wing
- ☐ Spreaders, sand or cinders
- ☐ Street Flushers
- ☐ Street Sweepers
- ☐ Welders
- ☐ Cutting Torches
- ☐ Hydraulic Jacks
- ☐ Hydraulic Control Equipment
- ☐ Hand Tools
- ☐ Hoists, derrick type

Be sure to fill in name and address below:

Your Name.....Title or profession.....

Name of your company or governmental department.....

Type of work for which equipment will be used.....

Street Address.....

City ..... State ..... County .....

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The ideal wire rope for crowd lines is TRU-LAY Preformed Improved Plow Steel. It gives better and longer service. It represents the proper combination of strength and toughness for the most grueling jobs. With this combination go long experienced engineering and thorough step-by-step inspections. And TRU-LAY Preformed comes in all constructions . . . all lays . . . all centers.

If you are buying wire rope for crowd lines or any other job get the help of an experienced American Cable engineer. Every salesman of American Cable wire rope has the exact specification (construction and grade) for every wire rope application. He can save you time and money. Wire for him today.

- LASTS LONGER
- HANDLES EASIER
- LESS LIKELY TO KINK
- SPOOLS BETTER ON DRUM

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TRADE MARK

In Business for Your Safety

Transforming a rough cobblestone street into a smooth, easy-riding pavement

Laying a two course Texaco Asphaltic Concrete pavement on a worn cobblestone street in Brattleboro, Vt.

Traffic on Main Street in Brattleboro now rolls along smoothly on its new Texaco Asphaltic Concrete pavement.

City officials of Brattleboro, Vt., decided something had to be done about the old cobblestone pavement on Main Street. Not only was it rough and uncomfortable to drive on, but its appearance did not reflect favorably on the community.

How Brattleboro successfully and economically solved its problem with the aid of Texaco Asphalt products will interest officials of other cities. First, inequalities in the old pavement were leveled off with a plant-mix of Texaco Rapid-curing Cutback Asphalt and broken stone. A resilient, heavy-duty Texaco Asphaltic Concrete pavement was then laid in two courses, having a combined thickness of 2½ inches.

Now, the heavy traffic on Main Street rolls along smoothly. Moreover, the attractive appearance of the smooth, skid-resistant Texaco Asphalt surface is an excellent advertisement for the city of Brattleboro.

For practical assistance with your street paving or maintenance problem, Texaco representatives, who are Asphalt specialists, are at your service. Write our nearest office.

TEXACO
REG. T. M.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

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